



TELCO

INTERNATIONAL TELCO REPORT 2021

Consumer adoption of 5G

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INTRODUCTION

December 1, 2018 marked the dawn of the 5G era, when South Korea's mobile operators launched the next-generation network to consumers. Less than three years later, roughly 61 countries, or 30% of the world's nations, now have access to commercial 5G services.

The new broadband standard is set to change so many aspects of our daily life. Nascent technologies, such as virtual and augmented reality, self-driving vehicles, smart cities and the internet of things will become commonplace thanks to the low latency and high speed of 5G.

Some recent events have taken place that have helped boost 5G rollout around the world. The first 5G iPhone was launched in October 2020, driving Apple's quarterly revenue over \$100 billion for the first time. In the value segment, smartphone makers — including China's Xiaomi and Realme — have released 5G-enabled Android devices for under \$200 in the US and £200 in Great Britain. (Related, three of the world's top five smartphone makers by units sold, Xiaomi, Oppo, and Vivo, are now Chinese.)

However, the coronavirus has slowed the 5G rollout. New smartphone sales fell globally in 2020, at a time when the growth of SIM-only contracts and slower handset innovation has led to longer smartphone lifecycles, with many people opting to keep their devices longer before upgrading.

Governments in the US and Europe are concerned the West is falling behind. With China swiftly building a national 5G network with speeds of one gigabit per second, Google's former chief executive Eric Schmidt has warned the next generation of Googles and Facebooks will not be from the Bay area — they'll be from China.

YouGov data shows that while 5G may be the future of connectivity, it has yet to catch on at scale, with massive variation in adoption and attitudes across global markets. Who are the dedicated, highly engaged early 5G adopters — and how can companies and brands effectively target them?

This report examines the demographics, behaviors, and preferences of this potentially lucrative group, and attitudes towards 5G products broadly, in key markets worldwide. YouGov surveyed a total of 18,803 respondents in 17 countries about their attitudes and decisions about 5G.

This research reveals great differences worldwide in how early adopters and mainstream consumer groups perceive 5G and its advantages. In some countries consumers are excited, in others they are indifferent or even concerned. This report provides a first glimpse into how market patterns are forming in different global markets as we enter the 5G age.

One key finding is that attempts by telecommunication companies (telcos) to explain consumer benefits of 5G thus far have been poor. Globally, 23% of respondents do not know if 5G will change how people connect to the internet. One third of US respondents do not know if they are paying for 5G. This translates to opportunity for telcos to increase sales simply by improving communication.

Another finding is the great disparity in 5G adoption around the world. In China, 55% of respondents have a 5G-enabled device, compared to 16% in Great Britain and France. Some of the greatest enthusiasm about 5G anywhere is found in India and Indonesia, where widespread 5G rollout has not begun at all.



GLOBAL 5G ADOPTION

Mobile phones are not only a communications tool but also the primary computing platform for much of the planet. At the end of 2020 there were 6.1 billion smartphone subscriptions globally (for a world population of 7.8 billion), a number forecast to reach 7.5 billion in 2026, according to the Swedish provider Ericsson. By then, smartphones will account for 85% of mobile subscriptions based on current trends. China and the remaining

Asia-Pacific region are the world's largest, and quickest growing, smartphone markets. Together they now make up half of global shipments, witnessing 30% and 28% yearly growth in the first three months of 2021, says Ericsson.

Smartphone ownership may be growing globally, but adoption of the new 5G standard, especially outside Asia, remains uneven.

While it may be the future of connectivity, 5G has yet to catch on globally

We may now be into the third year of 5G's commercial availability, but only 26% of consumers in the 17 markets in which we conducted research have 5G enabled smartphones; half (52%) do not, while 18% are not sure whether or not their smartphone is 5G enabled.

Current 5G enablement

% of respondents globally

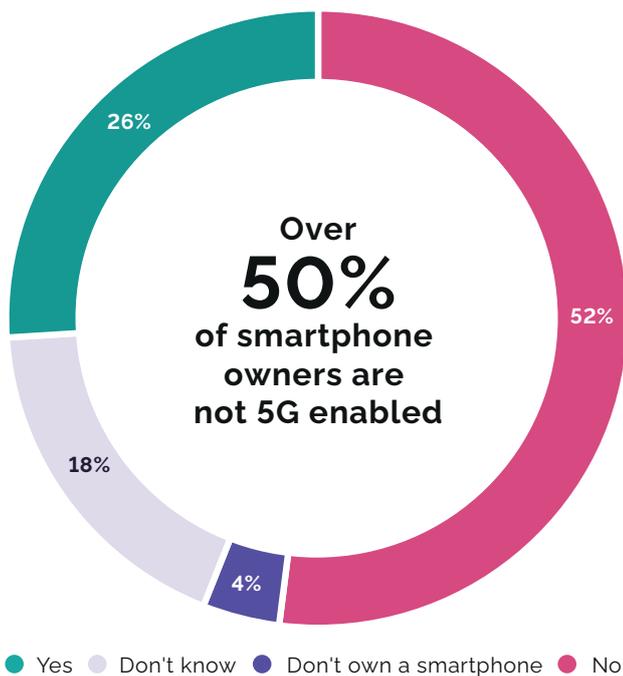


Figure 1

Thinking about your current smartphone, is it 5G enabled?



Despite fewer than 30% of global respondents saying they are “5G enabled”, we see pockets of greater adoption across geographies.

Under the surface of this headline number comes massive variation among countries. Asian markets, notably China (55%) and the UAE (48%), lead the way in 5G-enabled devices. Hong Kong and Indonesia also join the areas where more than 30% of respondents currently own a 5G device.

Europe and North America lag, with most countries experiencing 5G adoption rates below 25%. US respondents are less than half as likely as Chinese respondents to have a 5G device (26%). Respondents in Germany (17%), Great Britain (16%), and France (16%) are less likely still.

Current 5G enablement by country

% of respondents

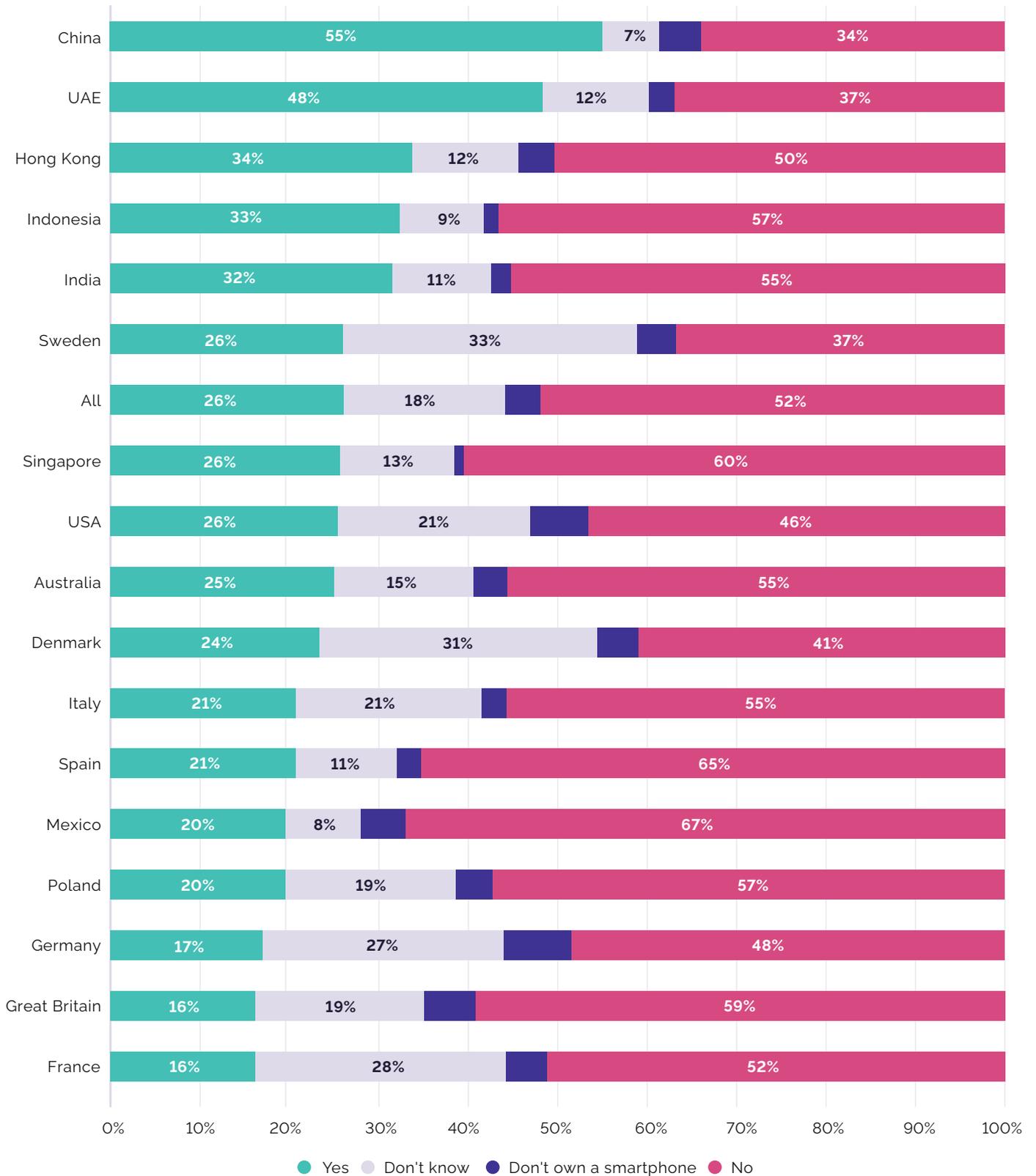


Figure 2

Thinking about your current smartphone, is it 5G enabled?

Younger consumers are more likely to be early adopters of 5G today and in the near future

The youngest age group surveyed, those aged 18 to 24, are most likely to believe that "5G will change how people connect to the internet", with 63% agreeing with the statement. They are also the least likely to have no opinion (16%), suggesting a higher engagement with 5G compared to older age cohorts. Respondents aged 25 to 44 are only slightly behind, with 61% agreeing. This falls off with 45 to 54-year-olds (57%), and further still with respondents aged 55 and older (53%). At the same time, "don't know" responses increased with the age of each group: 32% of all respondents aged

55+ didn't know if 5G would change how people connect to the internet, double the percentage for 18 to 24-year-old respondents.

The large percentage of "don't know" responses across age ranges — especially among older respondents with more discretionary income — presents an opportunity for telcos to better communicate the benefits of 5G. Companies keen to court older smartphone users could begin by better explaining the technology to them and how it will positively impact their lives.

5G will change how people connect to the internet

% of respondents globally

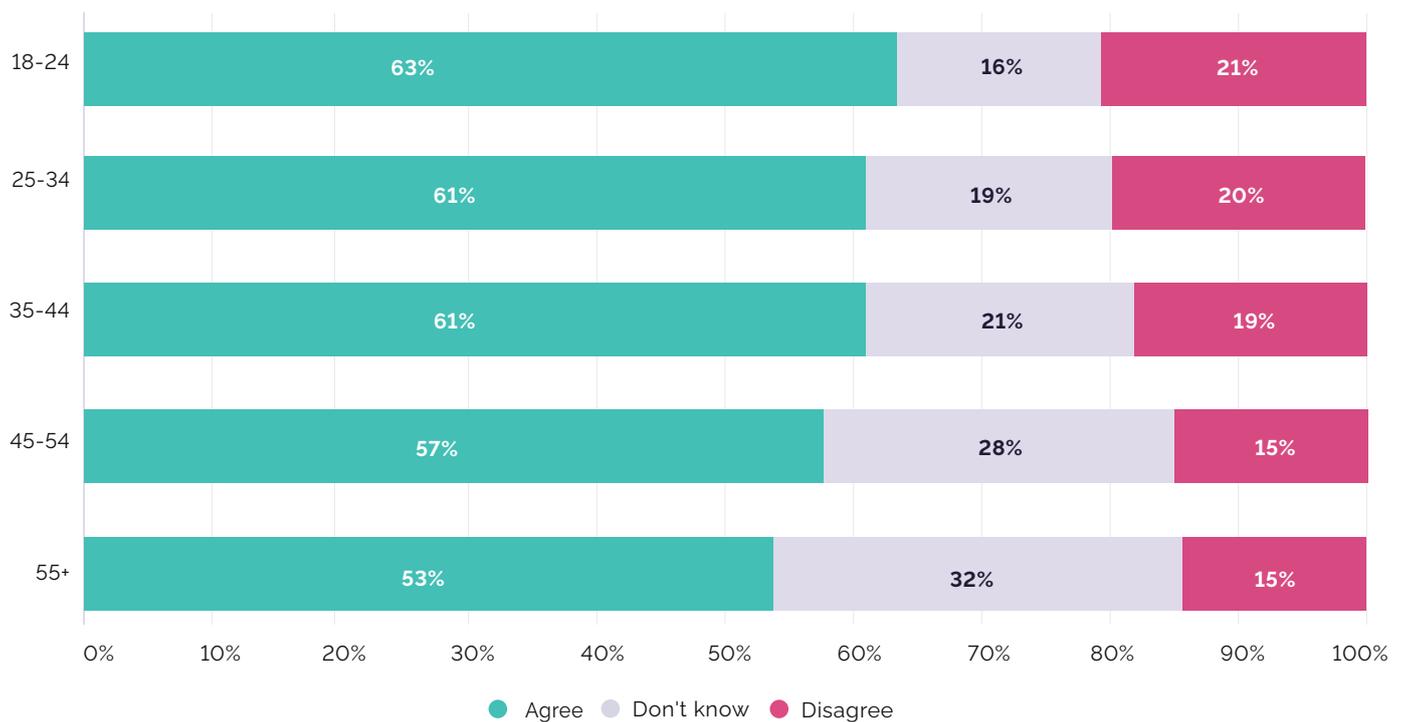


Figure 3

*To what extent do you agree or disagree with the following statement?
"5G will change how people connect to the internet"*

Attitudes among younger respondents towards 5G translate to higher levels of current engagement and future intent. Globally, 33% of 25 to 34-year-olds are likely to possess a 5G-enabled device today, twice as likely as respondents 55 years and

up (17%). Respondents aged 25 to 34 are most likely to be paying a 5G tariff to their network provider now (at 20%, compared to 12% of respondents aged 45 to 54, and 7% of respondents aged 55 and older).

Current 5G access & future intent by age

% of respondents globally

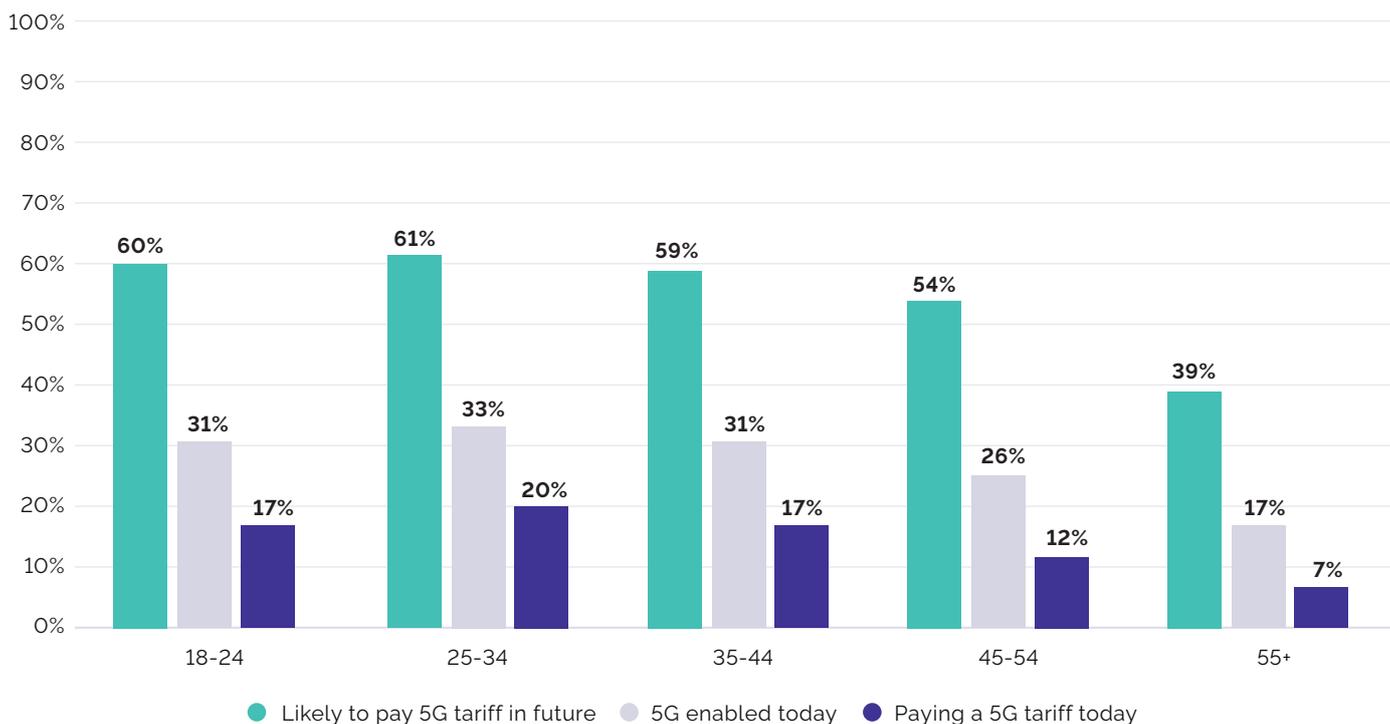


Figure 4

Thinking about your current smartphone, is it 5G enabled?

Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?

You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in future?





Emerging economies more likely to pay 5G tariffs today

Today, out of the 26% of respondents whose devices are 5G enabled worldwide, only 42% say they currently pay a 5G tariff – less than 11% of global respondents. One clear barrier telcos need to overcome is convincing consumers the benefits of 5G are worth the additional costs.

Currently 5G enabled

% of respondents globally

Currently pay 5G tariffs

Among 5G enabled respondents globally

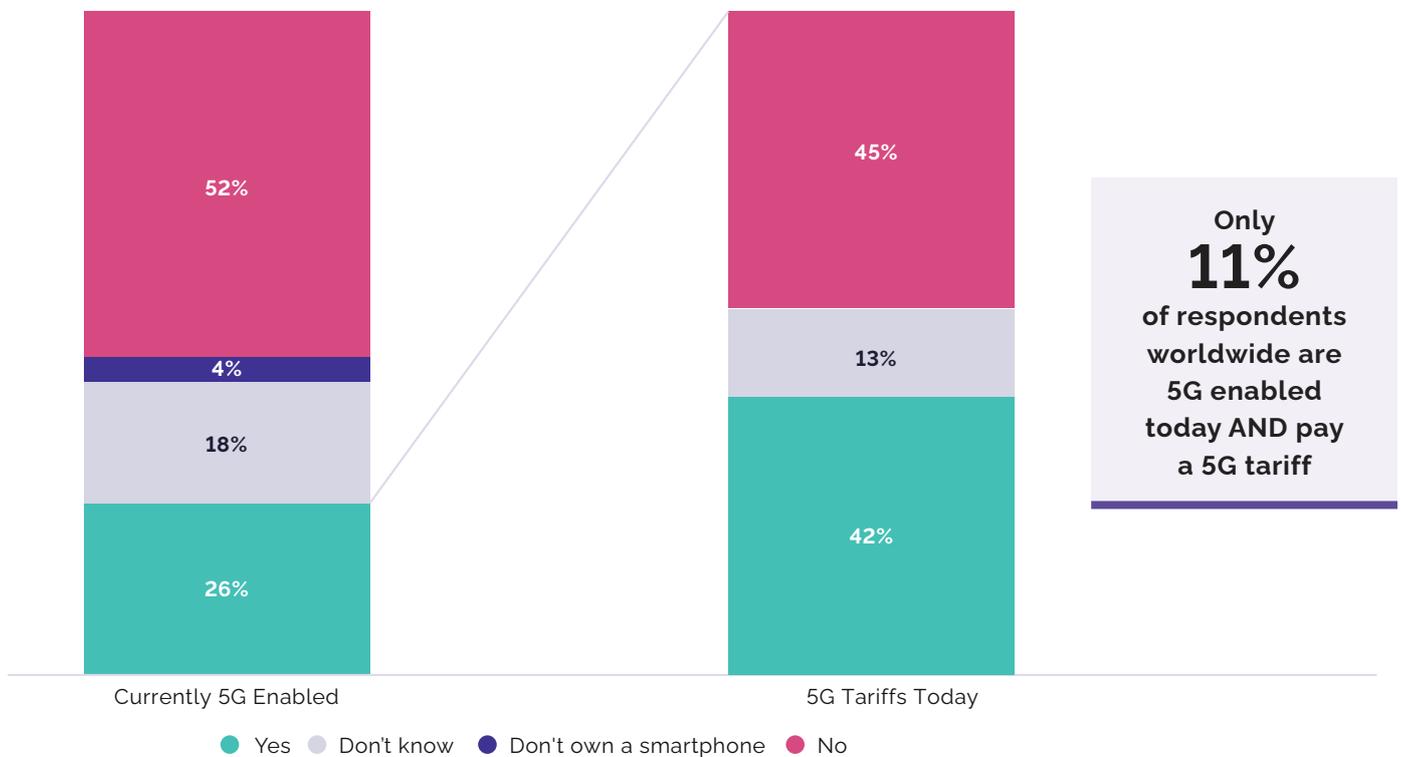


Figure 5

Thinking about your current smartphone, is it 5G enabled?

Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?

There is a marked difference between developed and emerging markets. In developed countries, 10% of respondents currently pay a 5G tariff, compared to 21% of those from emerging economies. Also, the percentage of respondents who do not know if they currently pay a tariff is much higher in developed countries (19% vs. 10%). A possible point of caution is respondents in some emerging markets, generally speaking, tend to agree with statements more than their peers in developed ones.

Currently pay 5G tariff by market development

% of respondents globally

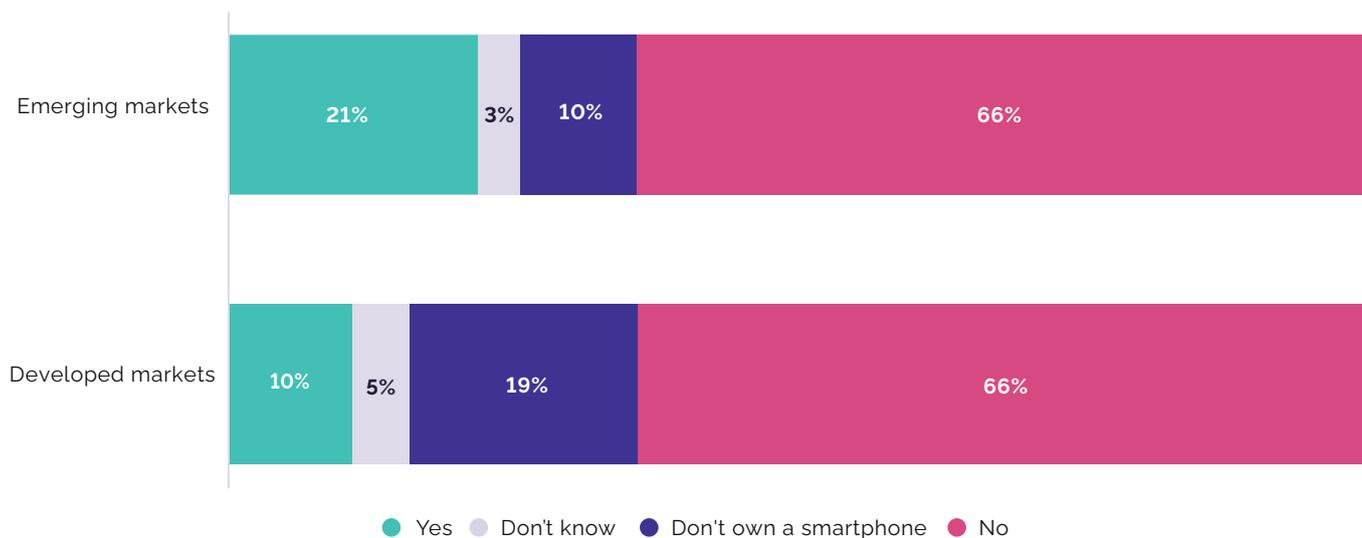
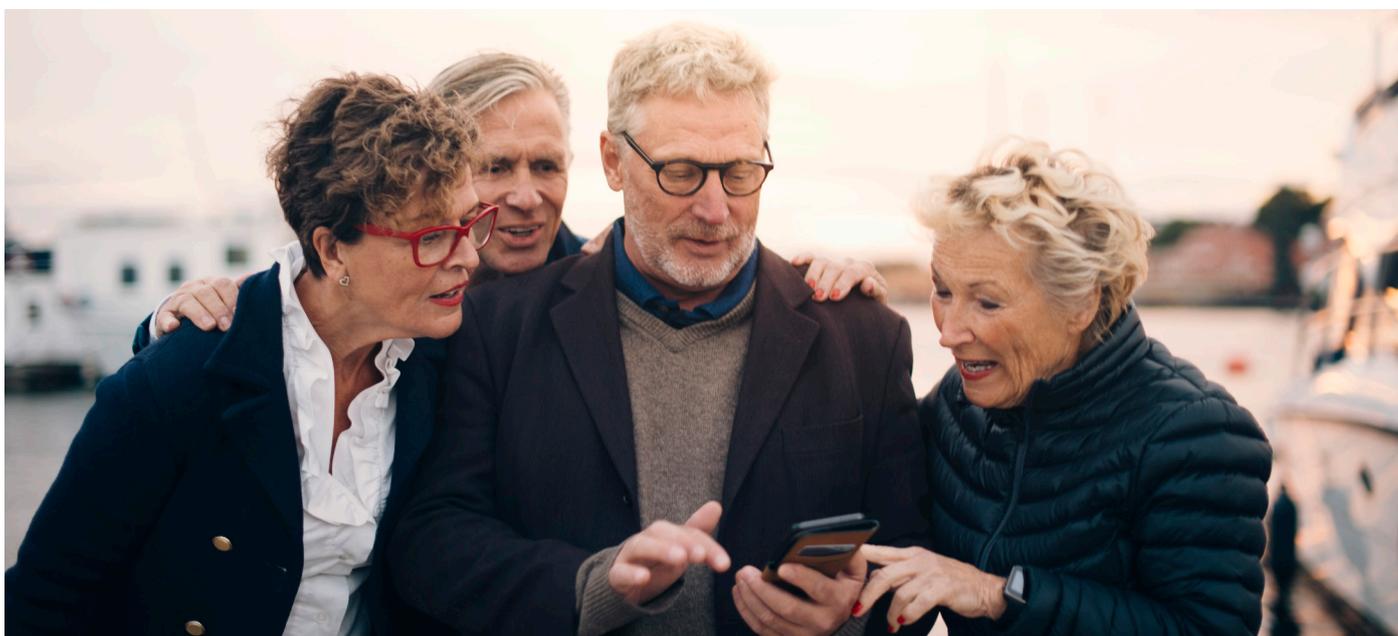


Figure 6

Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?

On a country-by-country level, about three in ten respondents in China (32%) and UAE (29%) say they currently pay 5G tariffs. That rate is nearly five times greater than for respondents in France (6%), Italy (6%), and the US (8%). What ought to be of

concern for US telcos is that a third of respondents (35%) are unsure if they are paying for 5G. Compare this with 8% in China. It is also significantly higher than other developed countries, like Great Britain at 13% or France at 9%.



Currently pay 5G tariff by country

% of respondents

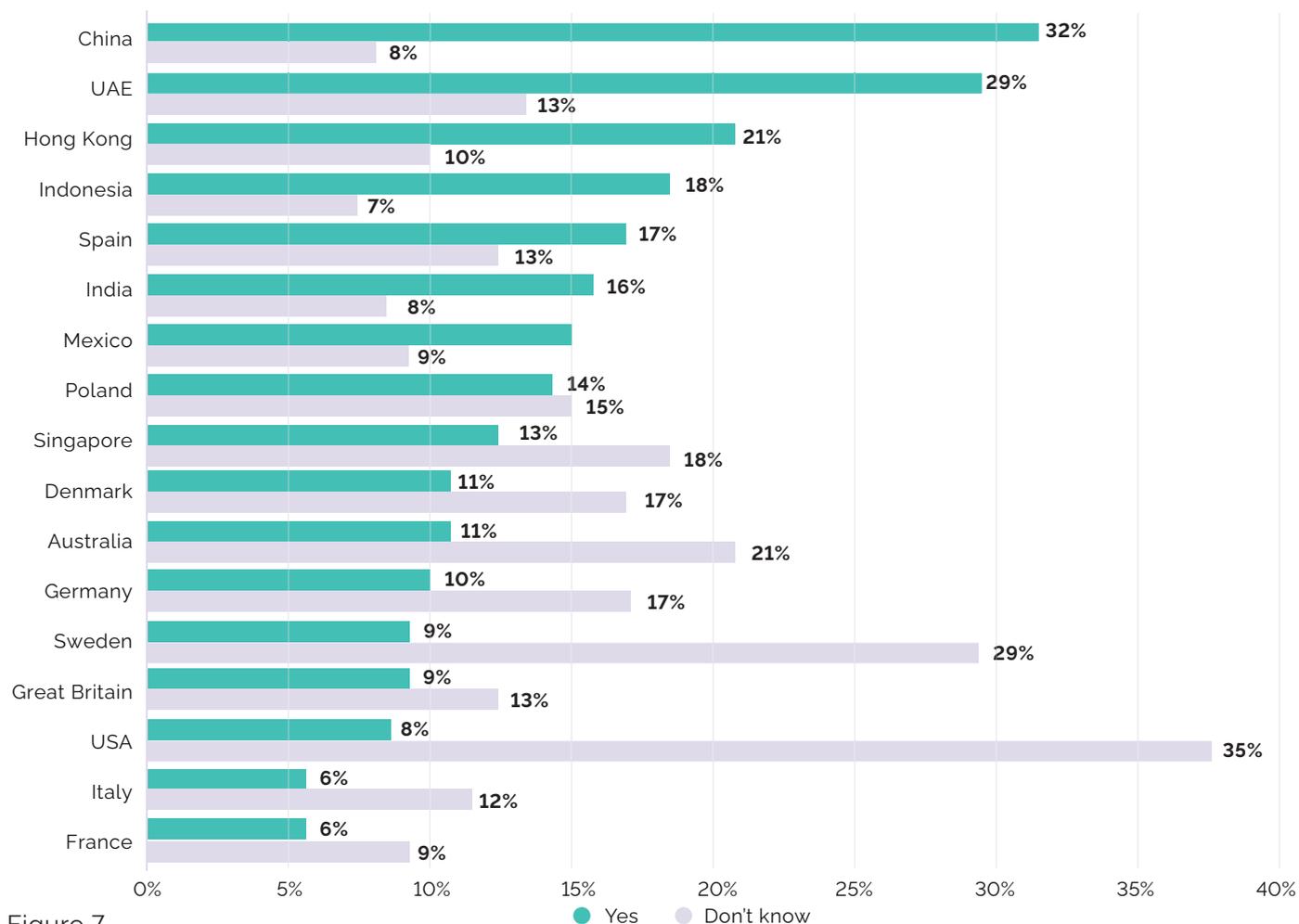
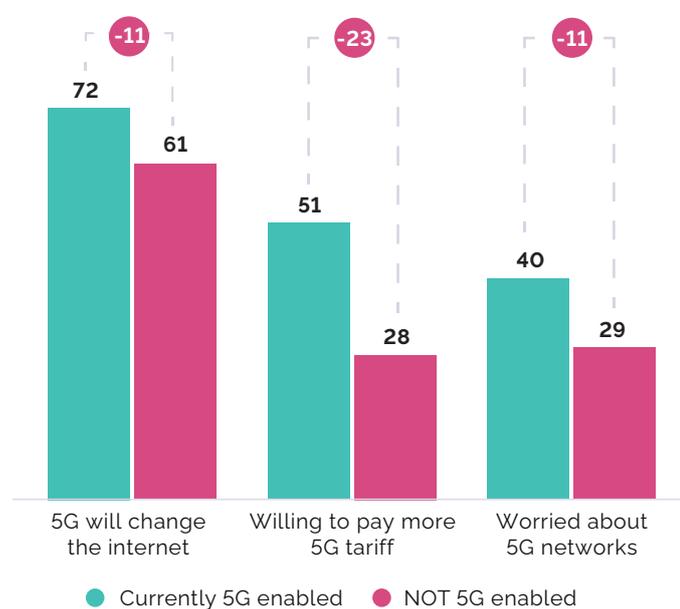


Figure 7

Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?

Attitudinal differences: current 5G customers vs. non-customers

% of respondents globally agreeing



The positive news for providers is that current 5G customers appear to see the benefit — and the value — of the next-gen network. While current customers are more likely to agree 5G will change the internet (72%, 11 percentage points more likely than respondents without 5G), they are even more likely to be willing to pay for 5G (51%, 23 percentage points more than respondents without 5G). This fact signals 5G is living up to expectations.

Figure 8

To what extent do you agree or disagree with the following statement "Thinking about your current smartphone, is it 5G enabled?"

The benefits of 5G should not be weighed without considering security and privacy concerns

Some consumers do harbor concerns about 5G. At one end of the spectrum sit baseless internet conspiracies about a relationship between the technology, COVID-19, and vaccines. However, more persuasive arguments involve the greater energy consumption (balanced by greater capacity) of 5G infrastructure, and security concerns about a mobile infrastructure which

is much more decentralized and virtualized than those that preceded it. About three in ten respondents (31%) worldwide say they have concerns about 5G networks. However, almost half (49%) disagree with the statement "I am worried about 5G networks", while one in five (20%) do not know.

Worried about 5G networks

% of respondents globally

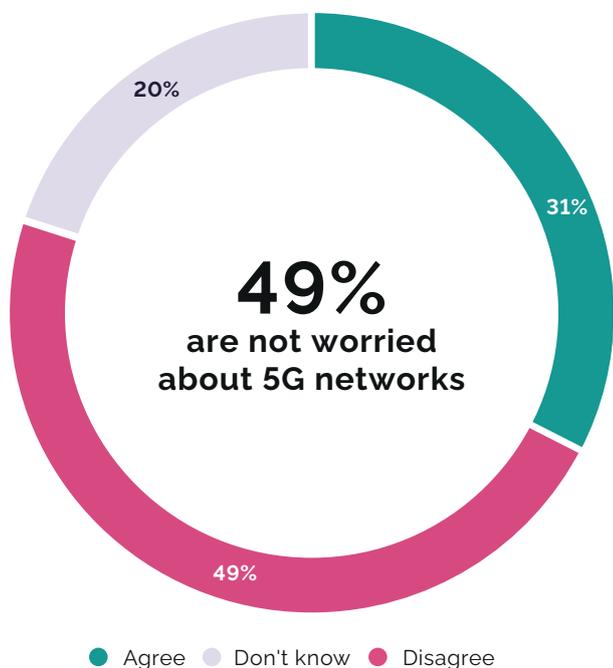


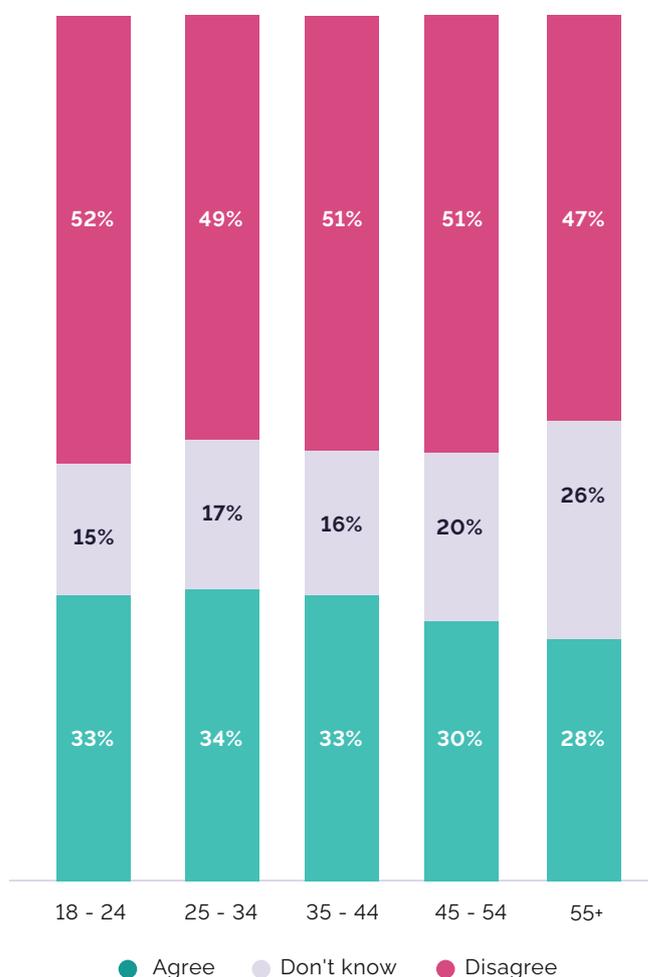
Figure 9

To what extent do you agree or disagree with the following statement? "I am worried about 5G networks"

The 25 to 34-year-old demographic is most likely to be worried about 5G networks (34%), falling to 30% for 45 to 54-year-olds, and further to 28% for those 55 and older.

Worried about 5G by age

% of respondents globally



5G network concerns strong in India, Asia-Pacific generally

Regionally, concerns about 5G are strongest in the Asia-Pacific area (38%), followed by Europe (25%) and the US (23%). This pattern roughly follows how widespread 5G adoption has been in the three areas. Respondents in India are particularly likely

to have worries about 5G (53%), along with the UAE, where nearly half (48%) of respondents say they are concerned. Concerns are also strong in China (41%) and Mexico (40%).

Worries over 5G by country

% of respondents

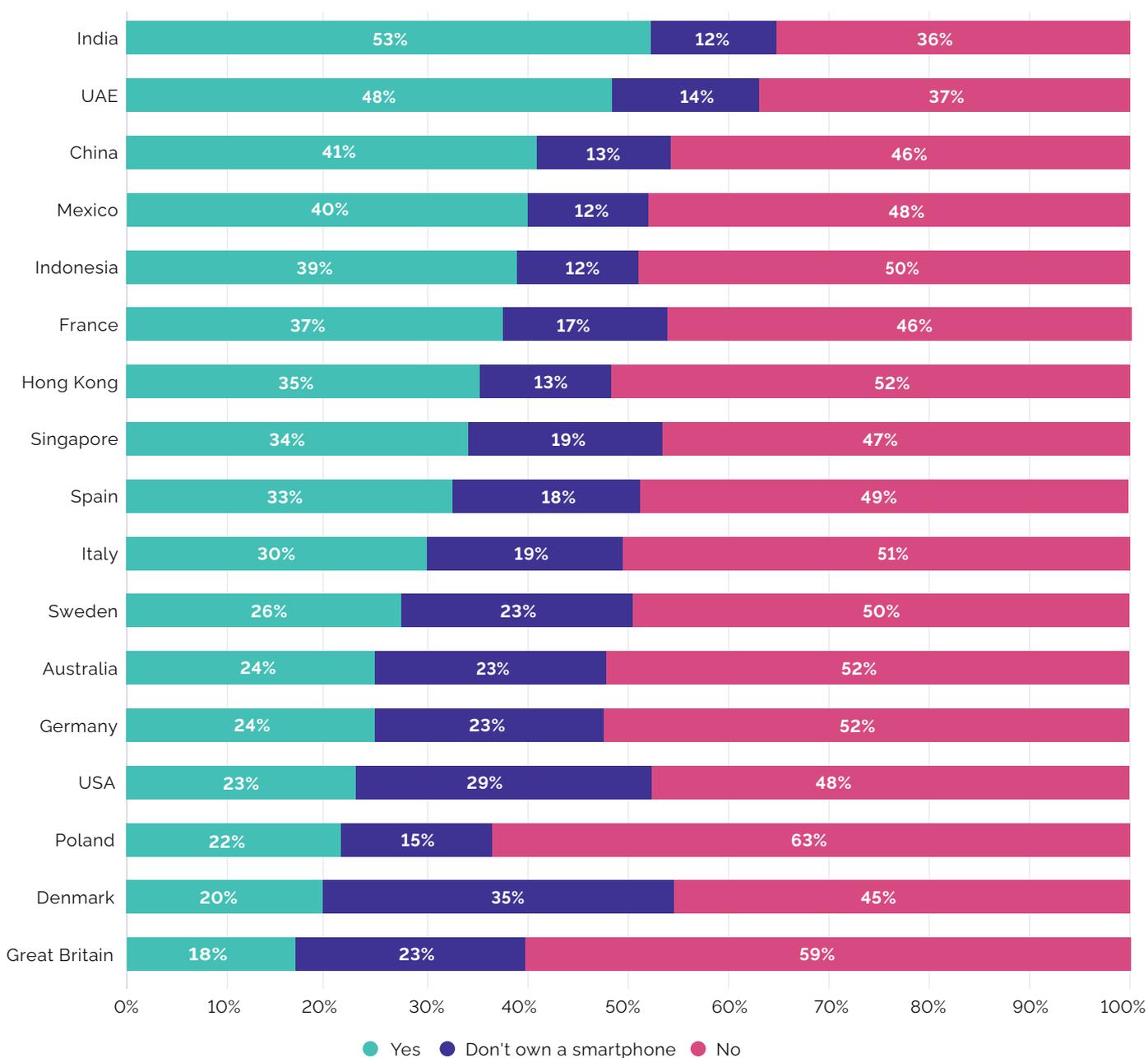


Figure 10

To what extent do you agree or disagree with the following statement? 'I am worried about 5G networks'

MiFi, virtual reality device users much more positive about 5G

When looking at respondents by connectivity types and device ownership, there are several categories of respondents who view 5G more favorably. Respondents currently connecting to the internet via MiFi (mobile hotspots) were

significantly more likely to agree that 5G will change the internet (71%) and in turn more willing to pay more (43%). It is worth noting 56% of respondents in China connect through MiFi, and globally this group skews younger.

% Agreeing 5G will change how people connect to internet

% of respondents among device owners

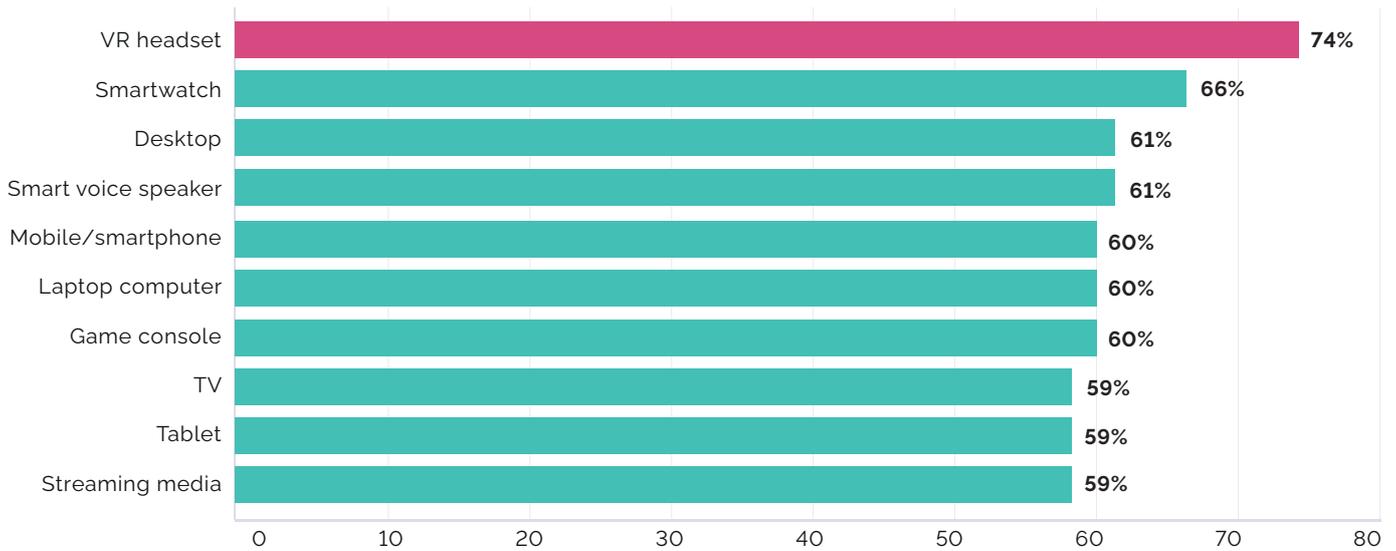


Figure 11a

To what extent do you agree or disagree with the following statement? "5G will change how people connect to the internet"

% Willing to pay MORE for 5G

% of respondents among device owners

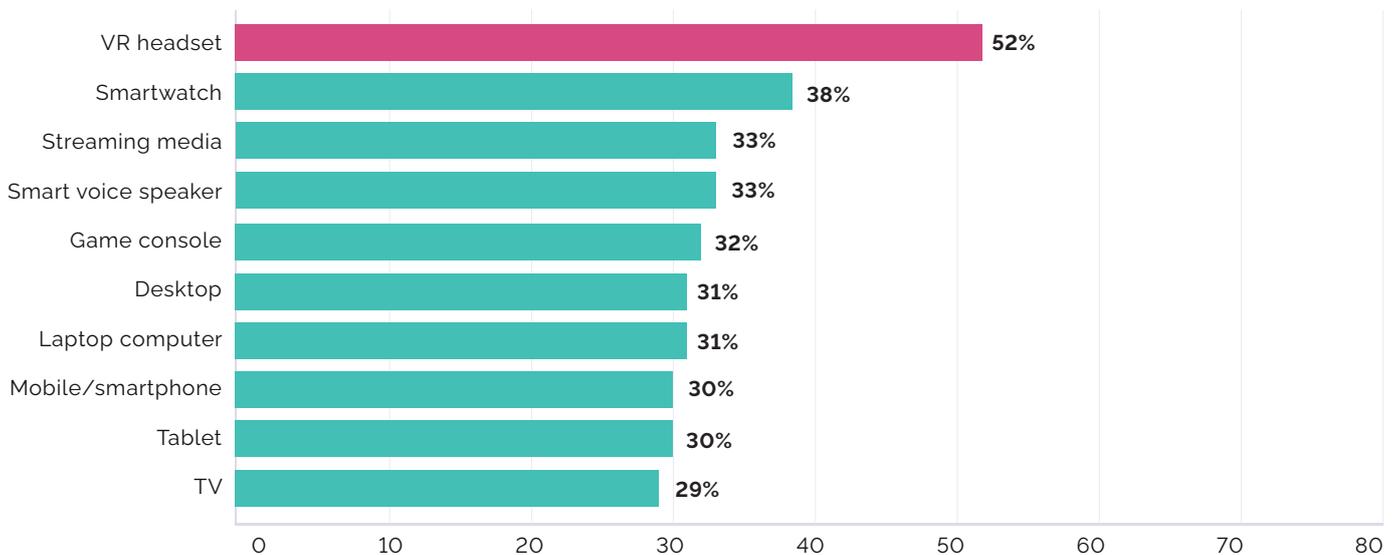


Figure 11b

To what extent do you agree or disagree with the following statement? "I'm willing to pay more for 5G access"

Virtual reality (VR) headset owners are more likely to have positive attitudes around 5G, compared to other device owners, with 74% of owners agreeing it will change how people connect to the internet. Faster connection speeds and lower latency are obvious drivers here. VR appeals more to Asian markets and to a younger base. Smartwatch owners, representing an early-adopter segment, are also more positive (66%) than owners of other devices.

VR headset owners were substantially more willing to pay more for 5G (52%). Smartwatch owners again followed (38%), with smaller differences among remaining device categories.

iOS users more favorable toward 5G

Users of Apple products are more favorable towards 5G – and more engaged with technology generally – than their Android counterparts in both the US and Great Britain.

Apple users in both countries are eight percentage points more likely to be "usually interested in trying the latest technology". They are more likely (+6 in the US, +7 in Great Britain) to be "often the first of my friends to try new technology", and to believe "technology changes my life for the better" (+6 in US, +7 in Great Britain).

These attitudes extend to Apple users' attitudes about 5G. In both the US and Great Britain, Apple users are more inclined than Android users to believe 5G benefits their life in many ways (+8 US, +4 Great Britain), to think it improves their digital experience (+8 US, +4 Great Britain), and to be willing to pay more to access 5G (+6 US, +4 Great Britain).

Clearly Apple customers represent an important target audience for providers' 5G efforts. However, UK operators have not yet convinced Apple customers to be as enthusiastic about 5G as they are about technology generally.

5G attitudes among iOS and Android OS users - USA & Great Britain

% of respondents among operating system users

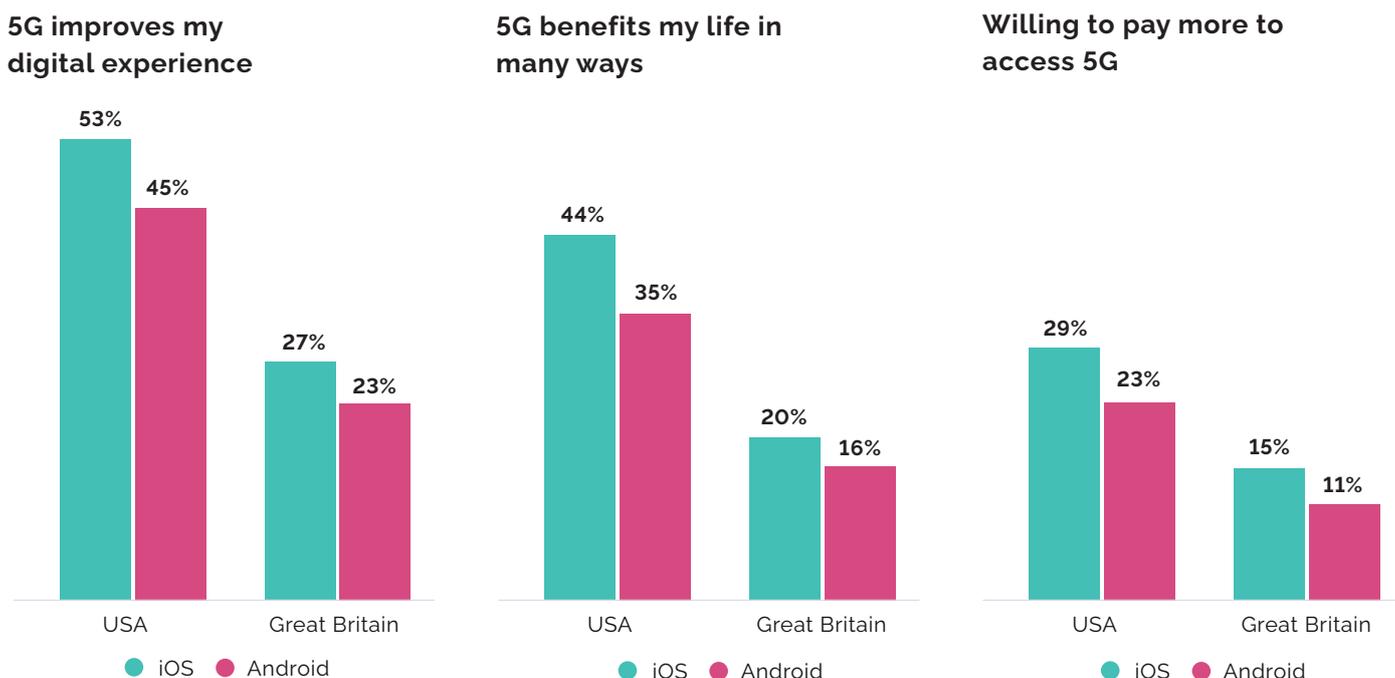


Figure 12

To what extent do you agree or disagree with the following statement?

Similarly, iOS users are outpacing their Android peers in both the US (+7) and Great Britain (+5) in 5G handset ownership. However, when asked how likely they are to move to a 5G plan in the future, it is Android users in both countries who are more likely to express a future intent to pay a 5G tariff (+6 Great Britain, +2 US).

5G Adoption & intent Apple/iOS and Android OS users – USA & Great Britain

% of respondents among operating system users

Thinking about your current smartphone, is it 5G enabled?

How likely are you to get 5G in the future?

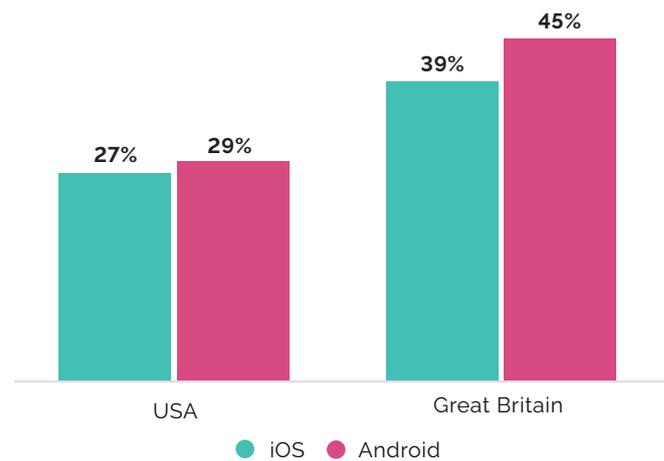
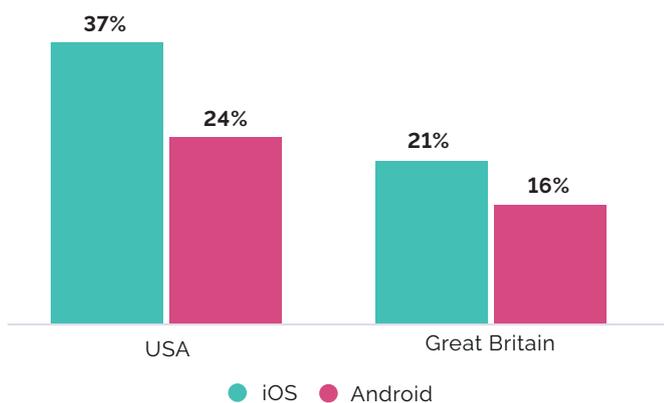


Figure 13a

Figure 13b

Wealth doesn't equal high 5G engagement

High levels of engagement with 5G does not mirror wealth. Countries with the highest per-capita GDP have slow rates of 5G adoption, and countries whose governments have made strong national commitments to building up 5G infrastructure quickly are currently ahead. The UAE made 5G part of a larger effort in transforming itself from an oil-based to a knowledge-based service economy and had planned to unveil its 5G progress to the world

at Dubai's Expo 2020 (ultimately postponed due to coronavirus). China, meanwhile, set aggressive goals for state-run telcos to meet 5G targets. Meanwhile, consumers in developed nations appear to feel their current networks are good enough. Citizens in wealthier nations are keeping their handsets longer before upgrading, a trend that has increased over the last few years and accelerated by the coronavirus pandemic.



5G IN THE USA

The US remains the world's largest and most mature telecom market. In 2020, 294 million Americans (of a population of 331 million) owned a smartphone. The consultancy firm Accenture estimates between 2021 and 2025 the new 5G standard will drive \$1.5 trillion in new GDP in the US, a figure larger than the national GDPs of Mexico and Brazil. America's two largest firms have bet accordingly on 5G spectrum earlier in 2021, with \$52.9 billion spectrum buys by Verizon, and \$27.4 billion by AT&T. The Swedish telco Ericsson

believes by 2026, North America will account for 80% of worldwide 5G subscriptions.

However, it almost seems no one has told the US consumer, who compared with global counterparts is less interested and less informed about the new mobile standard. Our results indicate that to reach US respondents, telcos have some work ahead of them to educate and convince the American public.

5G has an awareness and familiarity issue, especially with Americans

Our data shows respondents living in the US know much less about 5G than those in most other nations. As a result, they are far less sure of both their current and future 5G behaviors. The US is not the only market with this issue, but it is the market where it is most acute.

Even if it seems startling that 16% of global respondents are unsure if they are paying a 5G tariff, this pales in comparison to the US, where more than one in three (35%) do not know if they are paying for 5G today, and 54% are unsure if they will ever pay for 5G.

This uncertainty about 5G's benefits is pervasive around the world, but especially so in the US. This is likely driving the non-committal US response to future 5G tariffs. If nearly 40% of Americans "don't know" if 5G will change the internet, then why would they intend to pay more for 5G when 4G may be perfectly good enough?

% of "Don't Know" responses

Global vs USA

Current payment & future intent

5G Attitudes

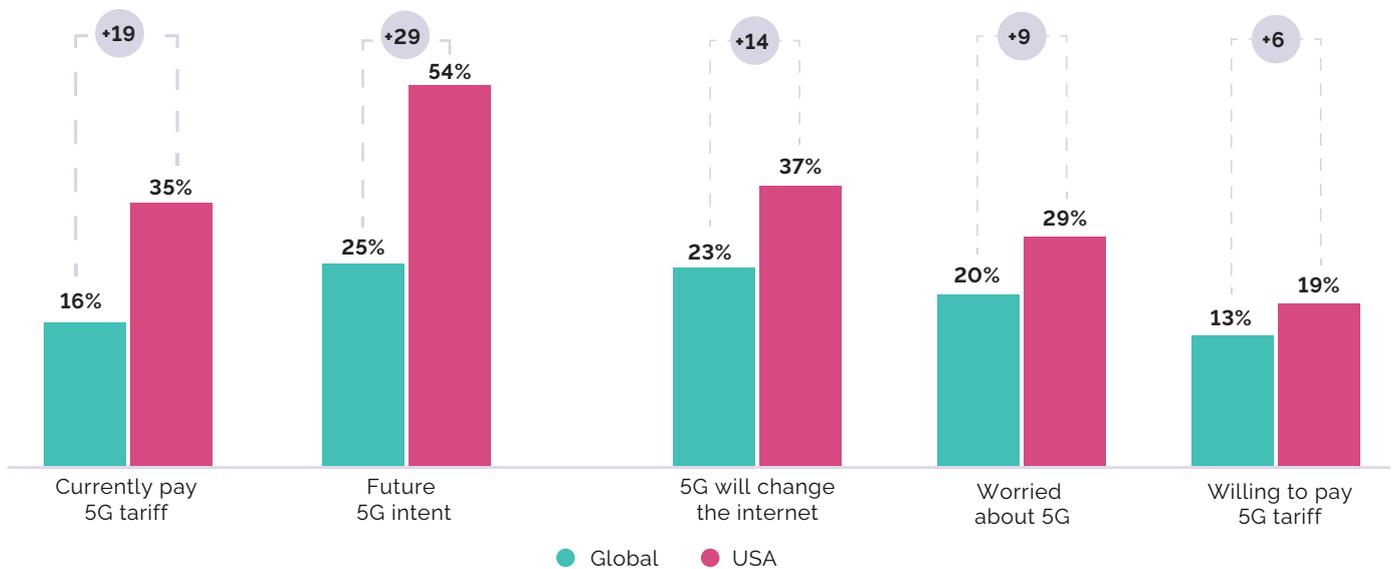


Figure 14

To what extent do you agree or disagree with the following statement?

"Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?"

"You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in future?"

Only one in five Americans have seen 5G advertisements

Despite major media investment, only about one in five Americans (22%) remember seeing ads for 5G. However, this represents many more people than have heard of 5G on social media (15%), the news (14%), or word of mouth (8%).

At the same time, one in five Americans (20%) has not heard anything about 5G technology at all. So for US carriers, further advertising could be a good investment to engage with an uninformed and skeptical US public. They need to do a better job of explaining the consumer benefits of 5G, beyond it just being faster.

Top information sources on 5G

% of US respondents

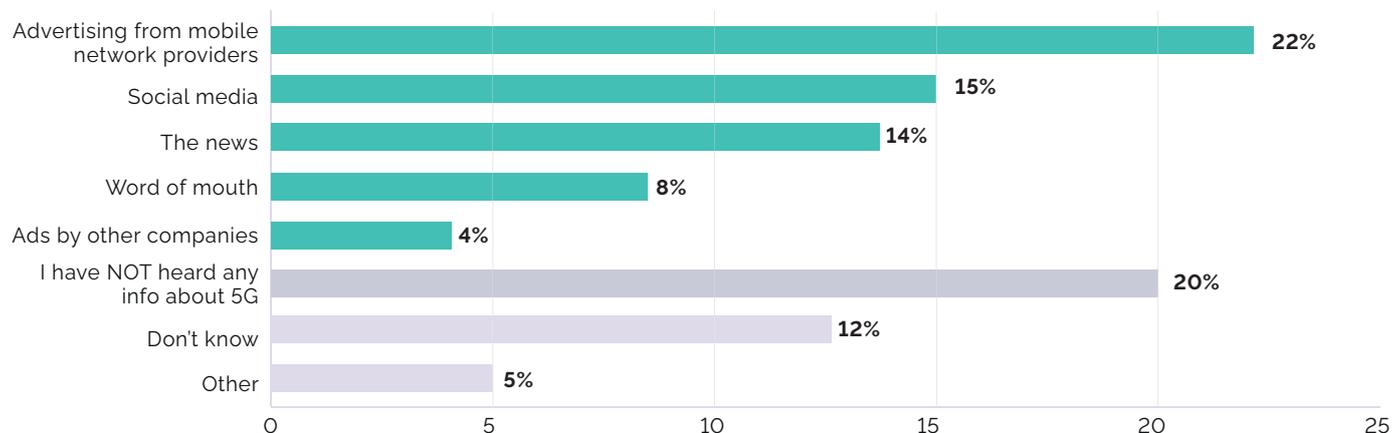


Figure 15

Where have you received information on 5G technology?

No major carrier has achieved a notable advantage over its competitors in its advertising reach: each American provider has reached roughly one in four US adults. However, it is in social

media use that interesting differences emerge. T-Mobile customers are much more likely to gain information about 5G from social media (21%) than customers of AT&T (12%) and Verizon (14%).

Sources of information on 5G in the USA

% of respondents by network provider customer base

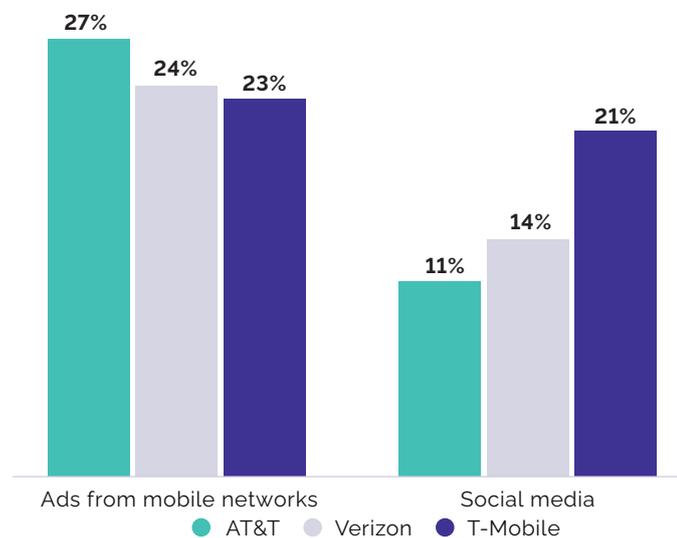


Figure 16

Two in five (42%) think 5G will be useful for improving their mobile data. Slightly fewer (32%) think it will improve connections and communications among their various devices. After a pandemic year of working from home, often with a mixture of office and home devices, these are advantages to which US respondents are particularly attentive.

Where have you received information on 5G technology?

On the other hand, Americans still have a great deal of doubt and uncertainty about 5G's usefulness. More than one in four (27%) do not know what 5G would be useful for. A further 15% do not think it will be useful at all.

Americans seem notably less familiar with uses for 5G in areas such as health care (20%), wearables (18%), connected cars and transport (18%), city maintenance (17%), and agriculture (11%). Each of these responses scored below 'don't know' (27%). Benefits that impact Americans on a social level score far below ones affecting them personally.

What will 5G be useful for

% of US respondents

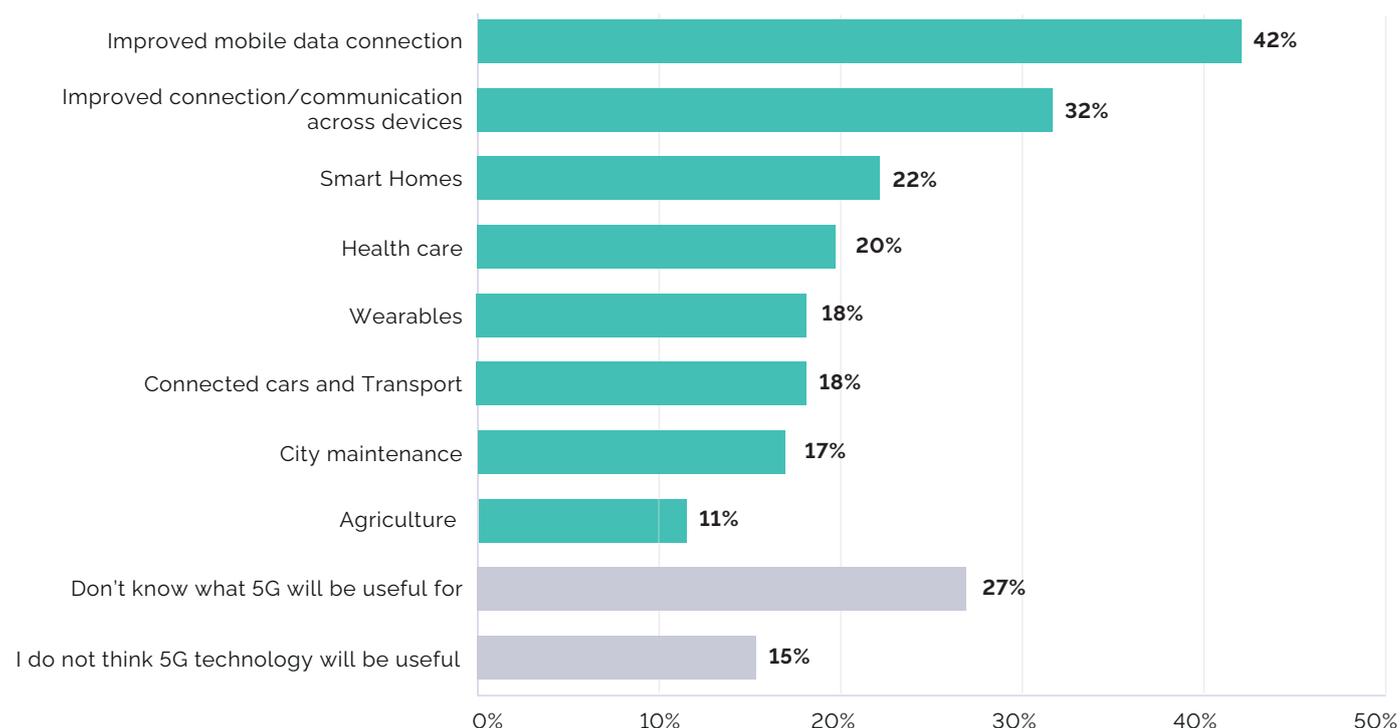


Figure 17

What will 5G technology be useful for?

One challenge 5G providers currently face in the US is willingness to pay for a 5G connection. It appears many Americans still believe that 4G is

"good enough" and that the benefits of 5G, which are harder to understand without experiencing, may not be worth the additional money.

Willingness to pay more for 5G technology

% of respondents - USA & Global

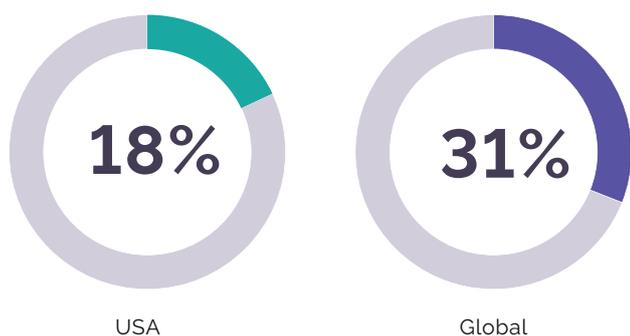


Figure 18

There are strong differences in willingness to pay for 5G by carrier. T-Mobile customers are also much more likely (34%) to say they plan to purchase a 5G tariff in the future, compared with customers of Verizon (25%). This is perhaps a reflection of their user base, as our data shows that T-Mobile customers are most likely to be younger. Almost half (47%) are aged 18-44, compared to 37% for AT&T and 38% for Verizon.



5G Future intent among network customers

% of US respondents among network customers

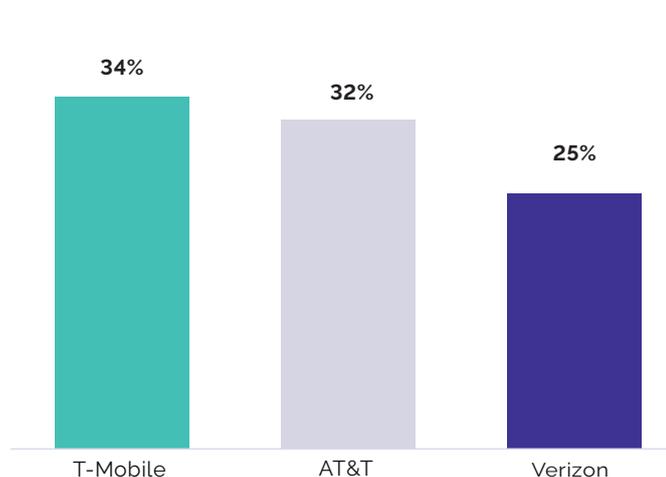


Figure 19

You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in the future?

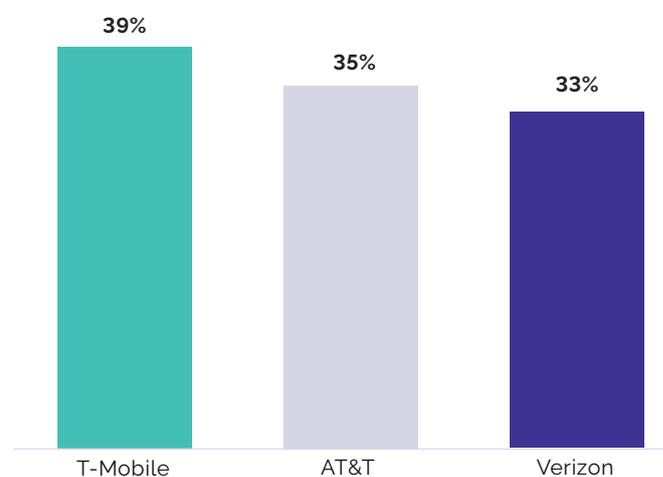


Figure 20

Thinking about your current smartphone, is it 5G enabled?

Verizon lags behind its competition when it comes to the proportion of users with a 5G-capable handset. Only 33% of Verizon customers do, compared with 35% for AT&T and 39% for T-Mobile.

Verizon customers, who generally skew older, are also noticeably less interested in technology overall, and 5G in particular. Only one in four Verizon users (24%) believe there is a technology solution for humanity's problems, compared to 37% for both AT&T and T-Mobile. Verizon users are less likely (27%) to be often the first of their friends to try new technology, well behind AT&T (37%) and T-Mobile (39%). Unsurprisingly, Verizon users are

less likely (18%) to be willing to pay more for 5G compared with AT&T (22%) and T-Mobile (26%).

Meanwhile AT&T users are more likely to be attracted by an improved mobile data connection (56%, versus 52% for T-Mobile and 47% for Verizon). T-Mobile customers are more apt to say 5G improves their digital experiences (53%, versus 48% for AT&T and 41% for Verizon).

Upgrading to 5G mostly driven by desire for a new handset

Looking forward, US respondents were asked why they would or would not upgrade to 5G in the coming year. These responses are telling about Americans' current attitudes towards 5G. Among those who do say they will upgrade to 5G, "excitement for 5G's benefits", ranks fourth as a reason (8%).

Upgrading is mainly driven by the desire for a new handset — not by the promises of 5G, suggesting again that providers' advertising has not yet hit its mark. Either respondents have aged out of their

current phone and need a new one (13%), or they are at a point in their current plan where they are eligible for a discount on a new handset (11%). Again, "don't know" comes joint first, in a tie with "I need a new mobile phone".

On the other side, those who are not interested in upgrading are driven by either a general lack of interest in 5G technology (17%, greater than any of the responses above), or a lack of willingness to pay the additional cost of a 5G-capable device (16%).

Top reasons to upgrade to 5G

% of US respondents

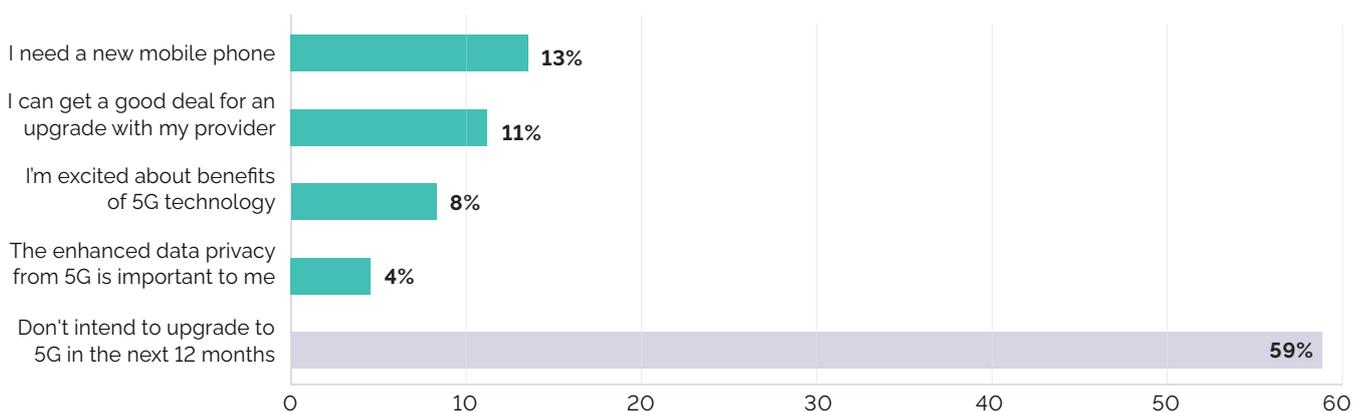


Figure 21a

Which, if any, of following statements describe why you are likely to upgrade your mobile phone to access 5G technology in the next 12 months?

Top reasons I'm unlikely to upgrade to 5G

% of US respondents

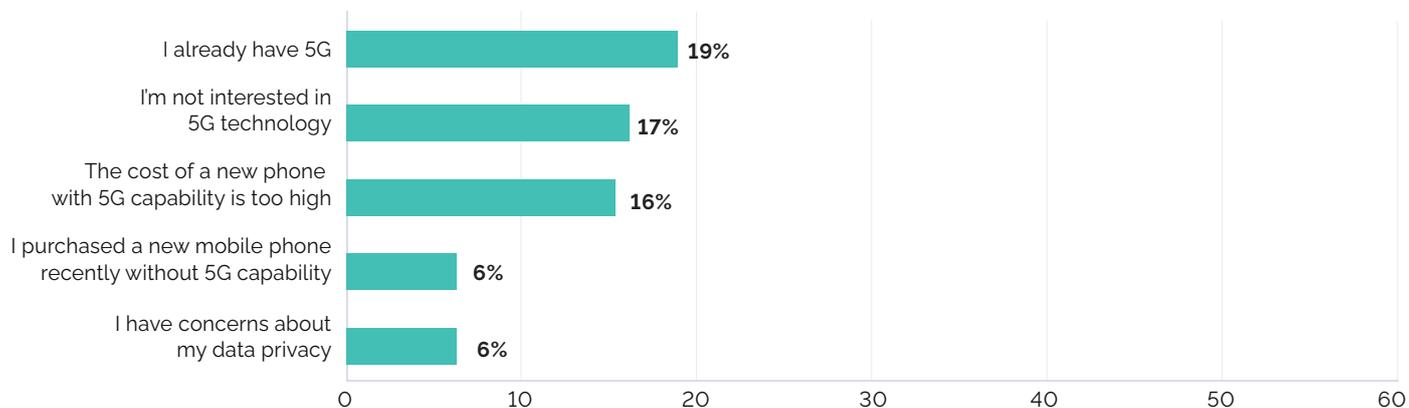


Figure 21b

Which, if any, of following statements describe why you are unlikely to upgrade your mobile phone to access 5G technology in the next 12 months?



5G IN GREAT BRITAIN

Great Britain is a huge smartphone market, with the number of mobile phone subscriptions (84 million) exceeding its almost 70 million population. Data usage is rapidly on the increase, too, with the final quarter of 2020 representing a 32.3% rise from the same period in 2019. Great Britain's telecommunications sector is also exciting and quickly changing, with the £31.4 billion merger of Virgin Media and O2 Great Britain into Virgin Media O2, completed in June, standing to shake up the market by providing a near-rival in scale for BT.

Coronavirus has hindered 5G's rollout in Great Britain. One measure is comparing the last 5G spectrum auctions to 2000, when Great Britain operators paid £22.5 billion for licenses for the 3G spectrum. In 2013, this shrank down to just £2.3 billion for licenses in the 4G spectrum. Great Britain's mid-lockdown auction of its remaining 5G spectrum in March 2021 raised only £1.3 billion, after a £1.4 billion initial auction in 2018.

If operators' enthusiasm (and budgets) appears muted compared with previous roll-outs, this is also true for consumers. In 2014, on the two-year anniversary of 4G's arrival in Great Britain, operator EE could boast 5.7 million customers for its 4G product. However, in May 2021, two years after EE launched arrival in Great Britain's very first 5G network, EE had only signed up 1 million customers to 5G tariffs.

Great Britain's 5G rollout has also been delayed by Westminster's July 2020 decision to ban Huawei's equipment from the country's 5G network. The government gave operators until 2027 to remove existing Huawei equipment from their networks, a task which will cost them an estimated £2 billion.

Many Brits unconvinced about 5G

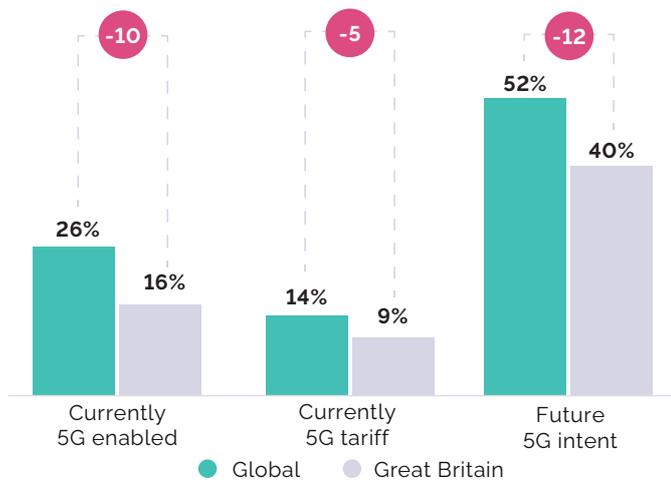
Great British respondents are more dubious than the global average about whether 5G will change the internet (39%, versus 59% globally) and are less likely to say they'll sign up to have 5G in the future (40%, versus 52%).

Similarly, respondents in Great Britain are less likely than their global peers to currently own a 5G device (16% vs. 26%), to pay a 5G tariff (9% vs. 14%), or to express willingness to pay for 5G (14% vs. 31%).

5G Behaviors & attitudes – Great Britain

% of respondents Global vs. Great Britain

Current behavior & future intent



Attitudes towards 5G

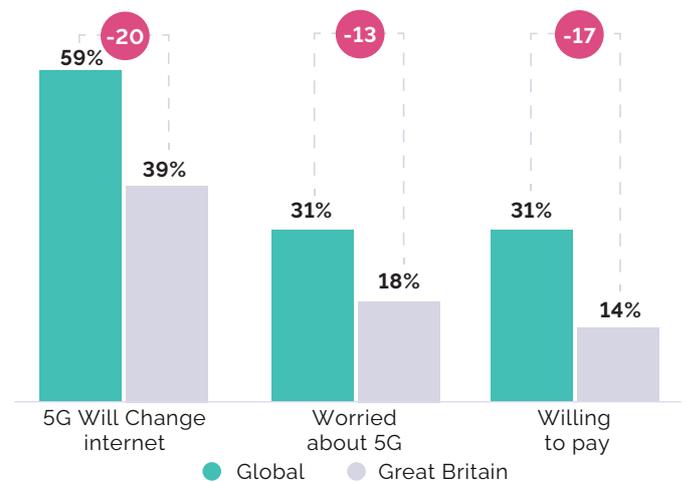


Figure 22

To what extent do you agree or disagree with the following statement?

"Thinking about your current smartphone, is it 5G enabled?"

"Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?"

"You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in future?"



Other quirks about the Great British market also help explain why people in Britain are slower to adopt 5G. British respondents are much more likely than people elsewhere to connect to the internet using home broadband (91% vs. 57%). They are, conversely, much less likely to get

online using mobile wireless hotspots, or MiFi (11% vs. 24% globally). Still, even if they rely on home broadband much more, they are more likely than global peers to use their smartphone's network connection, too (84% vs. 78%).

Personal & household connectivity - Great Britain

% of respondents Global vs. Great Britain

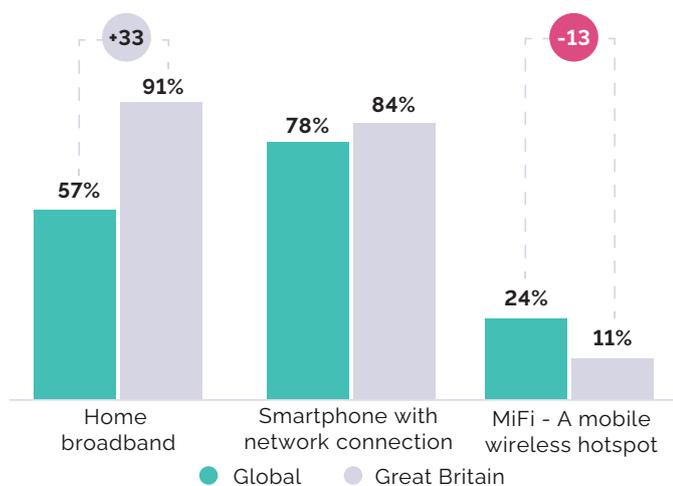


Figure 23

Which if any of the following do you have access to personally or within your household? Please select all that apply

Top information sources on 5G

% of Great British respondents

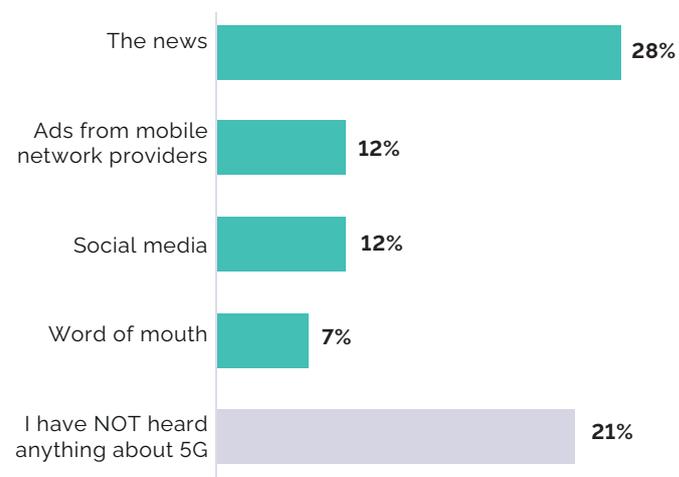


Figure 24

Where have you received information on 5G technology?



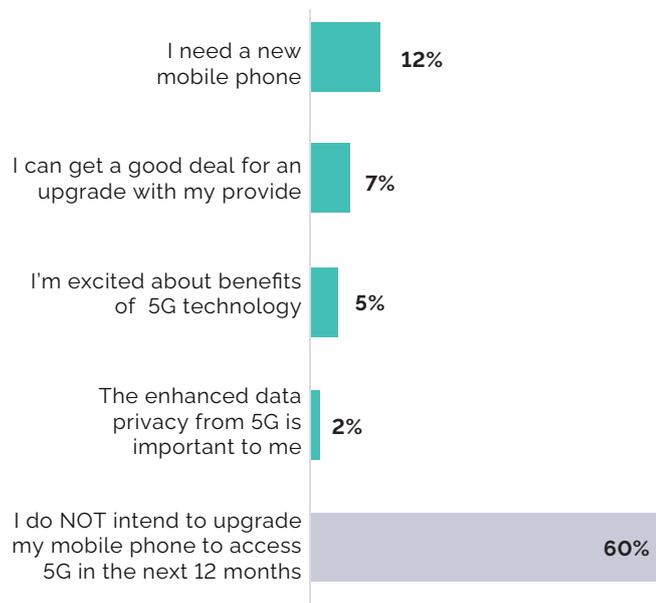
Just 12% of Great British consumers have seen operators' 5G advertisements

There is clearly a great deal of work to be done by telcos in Great Britain both in frequency of communication and their messaging about 5G's advantages. Among British respondents, only 12% cited mobile networks' advertisements as a source of information on 5G, equal with social media (12%). The news is the top source of information (28%) about 5G for respondents in Great Britain. This contrasts with US respondents, for whom mobile providers' advertisements were the chief source of information. Perhaps because Great British respondents are much more likely to get information about 5G from mainstream news sources than from social media, they also are less likely to worry about 5G networks (18%, versus 23% in the US and 37% in France).

Nonetheless, for most Great British respondents, 5G's tech benefits are still not sufficient to drive them to purchase a new phone. Belt-tightening and financial fears during the COVID-19 pandemic likely play a role here. When asked why they would upgrade, if they planned to in the next 12 months, the most common reason is the need for a new phone (12%) or whether there is a good deal to upgrade (7%). Only 5% cited being excited about benefits of 5G technology. When asked reasons not to upgrade to 5G in the next 12 months, 31% say they are not interested in 5G technology, while 18% say the cost of 5G smartphones is too high.

Top reasons to upgrade to 5G

% of Great British respondents



Top reasons I'm unlikely to upgrade to 5G

% of Great British respondents

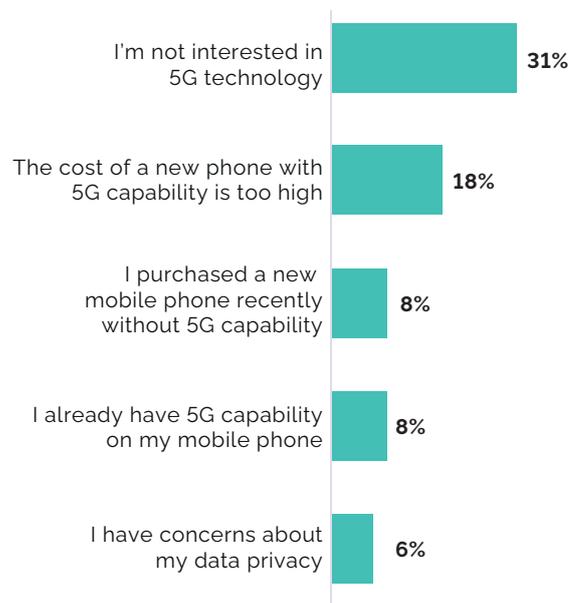


Figure 25

Which, if any, of following statements describe why you are likely to upgrade your mobile phone to access 5G technology in the next 12 months?

Which, if any, of following statements describe why you are unlikely to upgrade your mobile phone to access 5G technology in the next 12 months?

Respondents in Great Britain appear substantially less engaged with 5G technology than other emerging technologies, like virtual and augmented reality, wearables, and (perhaps understandably) robots. Telcos in Great Britain market may want to connect the benefits of 5G to other emerging technologies consumers are more aware of, such as virtual reality and wearables.

Attitudes towards technology in Great Britain

% of respondents agreeing

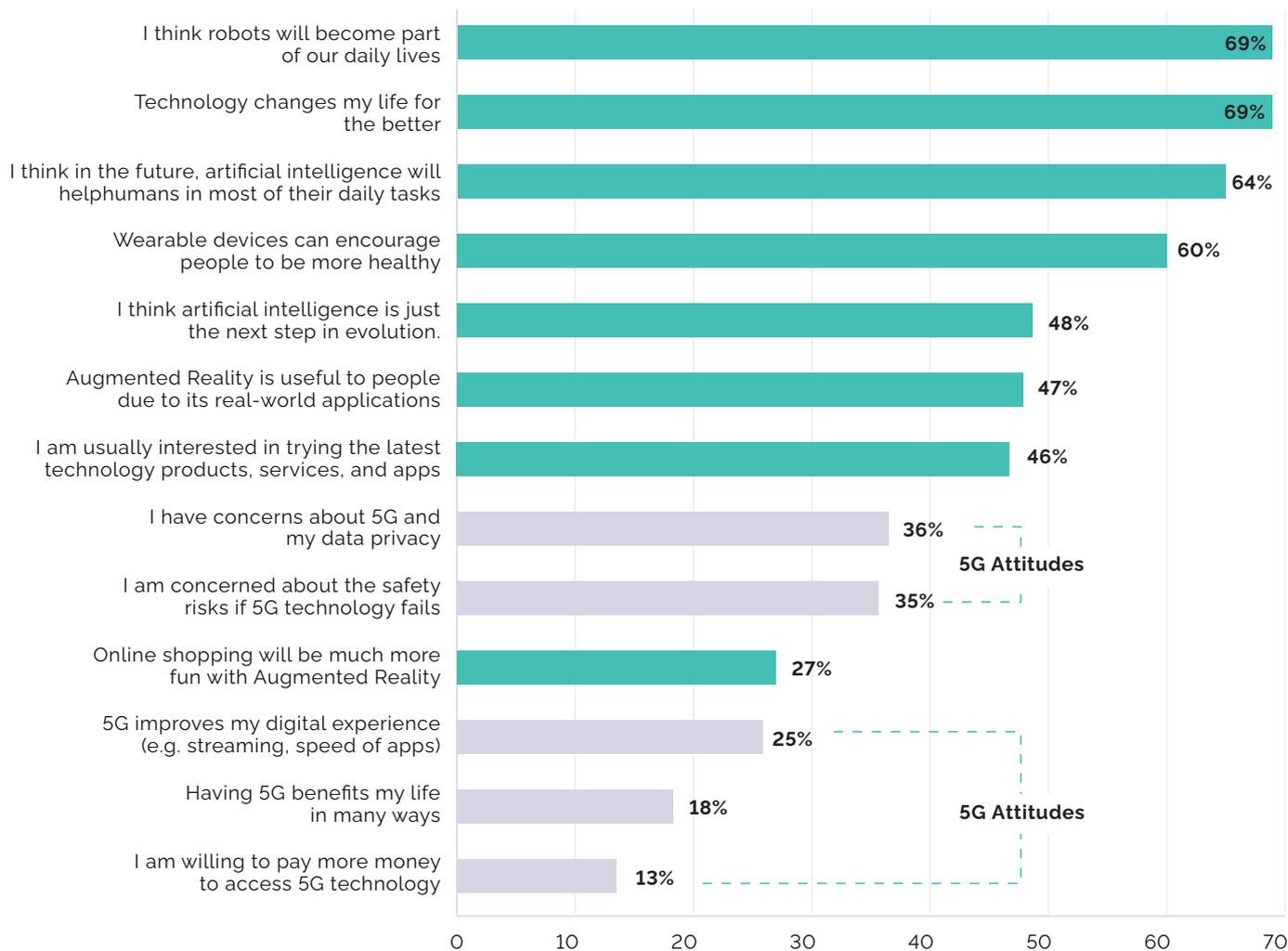


Figure 26

To what extent do you agree or disagree with the following statement?

Virgin customers are less interested in 5G technology

At a brand level, Virgin customers are less interested in technology generally, and 5G in particular, than customers on other networks. Only 20% of Virgin users say they are often the first to try new technology, compared with 30% of Three users. Just 21% of Virgin customers are interested

in trying the latest technology, versus 32% for both O2 and Three. The differences between Virgin Media and O2 customers may indicate good synergy behind the two companies' decision to join forces.

Attitudes towards technology & 5G in Great Britain

% of respondents agreeing by network customers

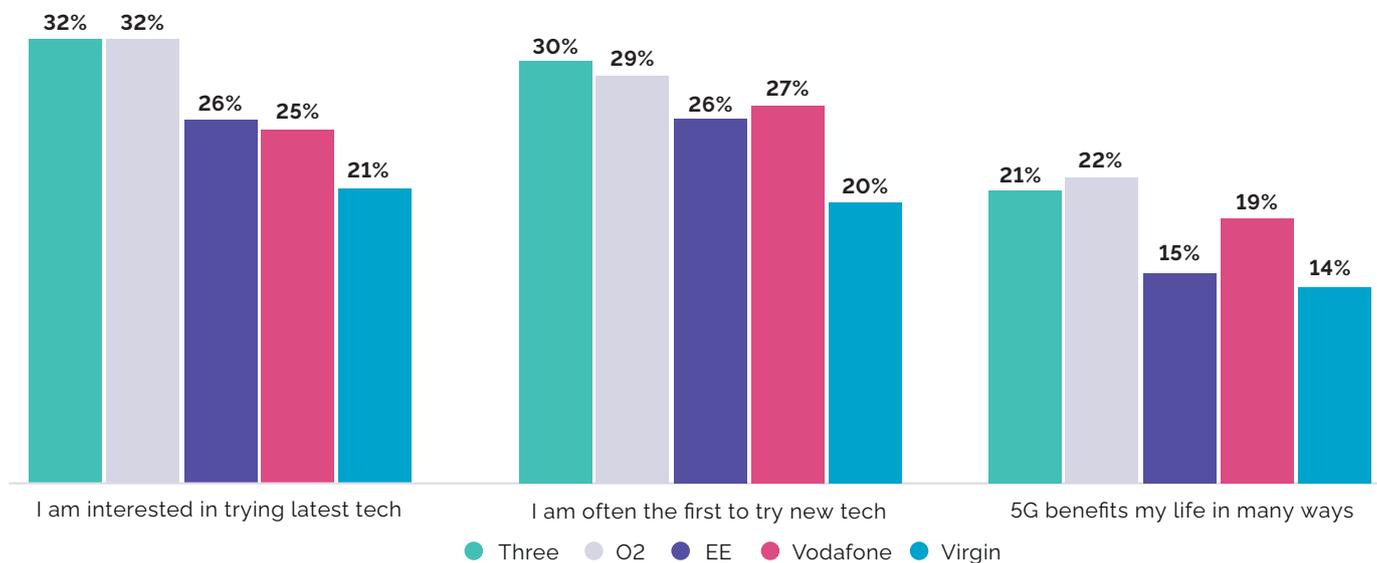


Figure 27

To what extent do you agree or disagree with the following statement?

Similarly, Virgin's customers lag behind those on other networks in having a 5G capable handset today (8%, compared to 12% and 13% for all other providers). Three customers meanwhile have the greatest intention to pay a 5G tariff (18%, versus

just 7% of Vodafone customers). Three users are also the most likely (15%) to move to a different network because of better 5G offerings, compared with just 2% for O2.

5G Current access & future intent in Great Britain

% of respondents by network customers

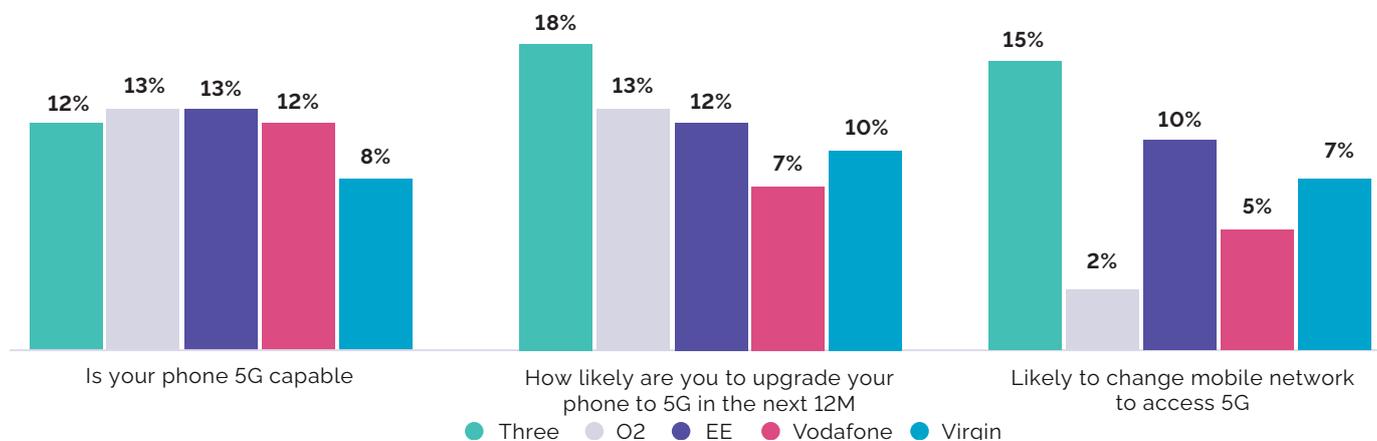


Figure 28

Thinking about your current smartphone, is it 5G enabled?

How likely are you to upgrade your phone to 5G in next 12 months?

How likely are you to change mobile networks to access 5G in next 12 months?



5G IN FRANCE

France is a large and wealthy market, but operators should note that French customers are more concerned about 5G's impacts, especially on the environment, compared to global consumers.

When France, Europe's third largest telecoms market, auctioned off its 5G frequencies in September 2020, Orange, its largest telecoms company, was riven by internal controversy over whether to roll out 5G networks at all. A group of Orange employees, calling themselves "Je Suis Si Vert" ("I'm So Green") circulated memos arguing the technology will be bad for the environment and unprofitable. Meanwhile France's Green Party, Europe Écologie Les Verts (EELV), argued energy needed to run 5G would increase greenhouse gas

emissions. The population was receptive to these claims and EELV made gains in local elections. They took control of local governments in Lyon, Marseille, Montpellier, Bordeaux, and Strasbourg, and helped Paris mayor Anne Hidalgo secure a second term in a coalition with her Parti Socialiste.

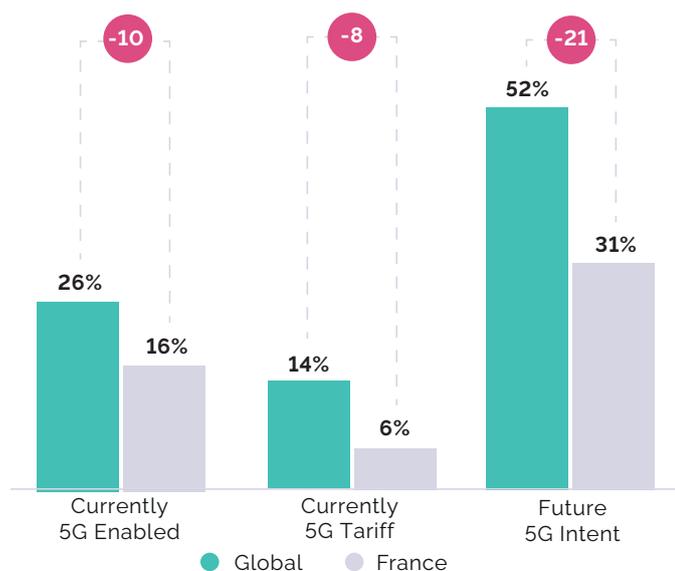
In February 2021, France's four providers, Orange, Bouygues Telecom, Free Mobile, and SFR, entered into a charter with Hidalgo's municipal government before launching 5G in the capital. The companies agreed to monitor 5G's environmental impacts, to limit public exposure to radio waves, and to provide Parisians with transparent information on 5G impacts.

In this context it is unsurprising that concerns over 5G's effects are higher in France than in other countries (37% vs. 31% globally). French respondents are much less likely to express any intent to have 5G in the future (31% vs. 52%), and substantially less willing to pay for it (9% vs. 31%). People in France are much less likely than elsewhere to have a 5G tariff (6% vs. 14%), or a 5G-enabled device (16% vs. 26%).

5G Behaviors & attitudes in France

% of respondents Global vs France

Current behaviors & future intent



Attitude towards 5G

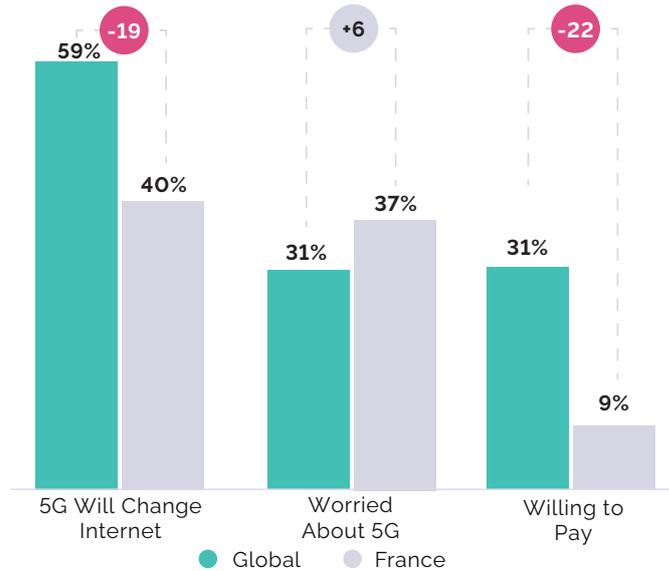


Figure 29

To what extent do you agree or disagree with the following statement?

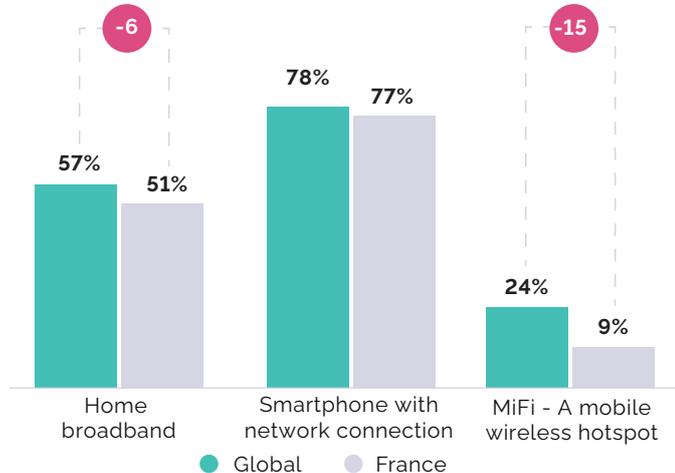
"Thinking about your current smartphone, is it 5G enabled?"

"Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?"

"You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in future?"

Personal & household connectivity in France

% of respondents Global vs France



Like their British counterparts, French respondents are also much less likely than the global average to use mobile wireless hotspots to get online (9% vs. 24%).

Figure 30

Which if any of the following do you have access to personally or within your household? Please select all that apply



5G IN GERMANY

High politics has influenced Germany's 5G rollout as Chancellor Angela Merkel found herself torn between Washington and Beijing. The Biden administration, with an eye on its first midterm election, largely continued the Trump administration's hawkish approach towards Chinese tech companies.

Deutsche Telekom (which accounts for nearly a third of the €26 billion German mobile communications market, in revenue terms) has relied heavily on Huawei for its 5G antennas. While Great Britain banned the Chinese operator and France informally excluded it, Germany instead wrapped Huawei in red tape with a new IT Security Act, adopted in April 2021.

On the whole, there does appear to be greater acceptance and understanding of 5G among German consumers. German customers appear more positive about 5G and more likely to have upgraded personally than respondents in France, Britain, and the US. Germans are also more likely to think 5G will change how people connect to the internet (46%, above 44% in the US, 40% in France, and 39% in Great Britain).

5G Attitudes - 5G will change how people connect to the internet

% of Respondents agreeing by country

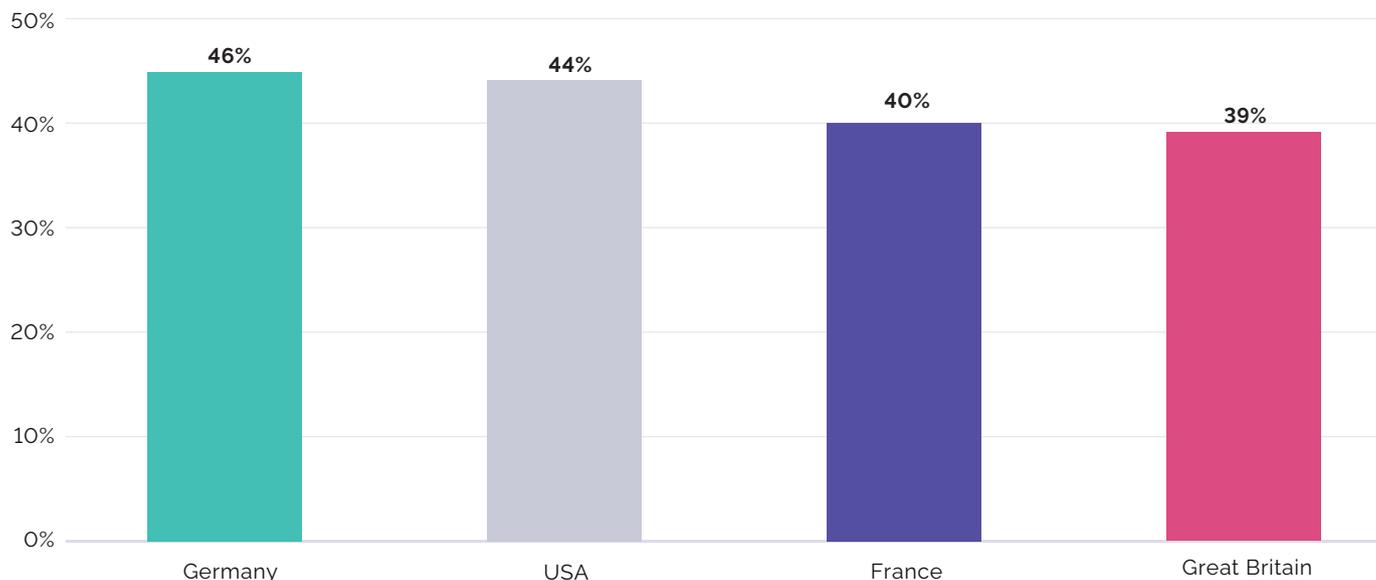


Figure 31

To what extent do you agree or disagree with the following statement?

"Thinking about your current smartphone, is it 5G enabled?"

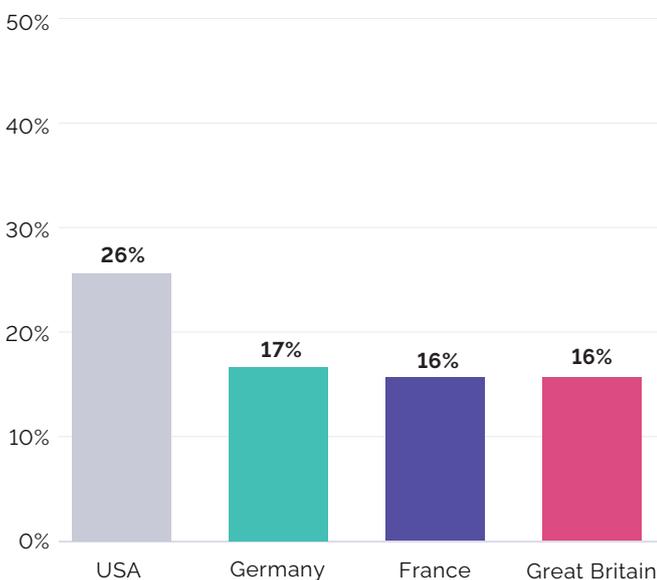
"Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?"

"You said you don't currently have a 5G tariff. How likely are you to get a 5G tariff in future?"

German respondents (17%) are also slightly ahead of Great Britain and France (both 16%) in owning 5G-enabled smartphones, though they lag behind the US (26%). In currently paying for a 5G tariff, German respondents (4%) were somewhat in the middle, ahead of France (2%), but behind Great Britain (7%) and US (6%).

Current 5G enablement

% of Respondents agreeing by country



Importantly, consumers are much more willing to pay a higher price for 5G (19%) than respondents from France (9%), and more willing too than Great Britain (14%) and US (18%) respondents.

Figure 32

Thinking about your current smartphone, is it 5G enabled?

5G Tariffs by Country

% of Respondents by country

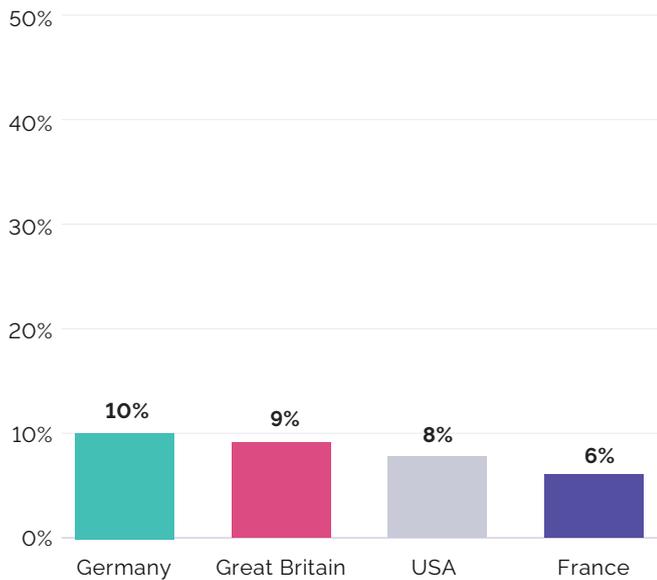


Figure 33

Do you currently have a 5G tariff for your MAIN mobile handset (i.e. the one you use the most)?

Providers should bear in mind though that concerns about 5G networks are moderately widespread in Germany. One in four German respondents (24%) agreed with the statement

5G Attitudes - I am willing to pay more to access 5G

% of Respondents by country

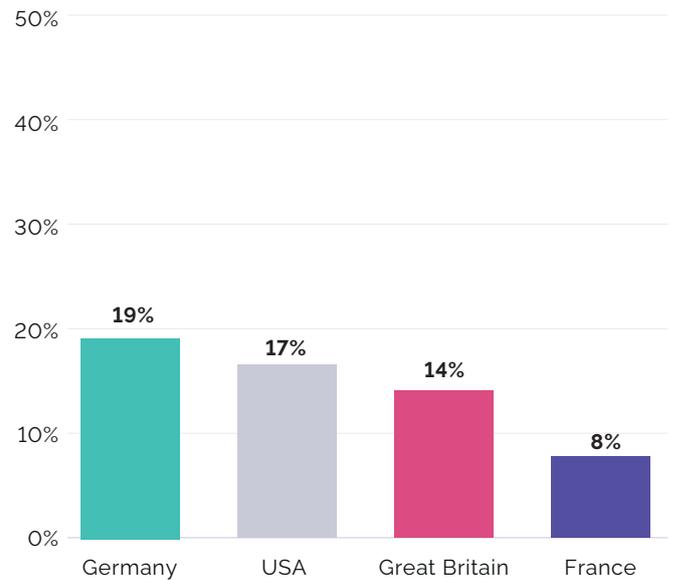


Figure 34

To what extent do you agree or disagree with the following statement:

"I am worried about 5G". This was greater than in Great Britain (18%) and US (23%), but substantially less than France (37%).

5G Attitudes - I am worried about 5G networks

% of Respondents agreeing by country

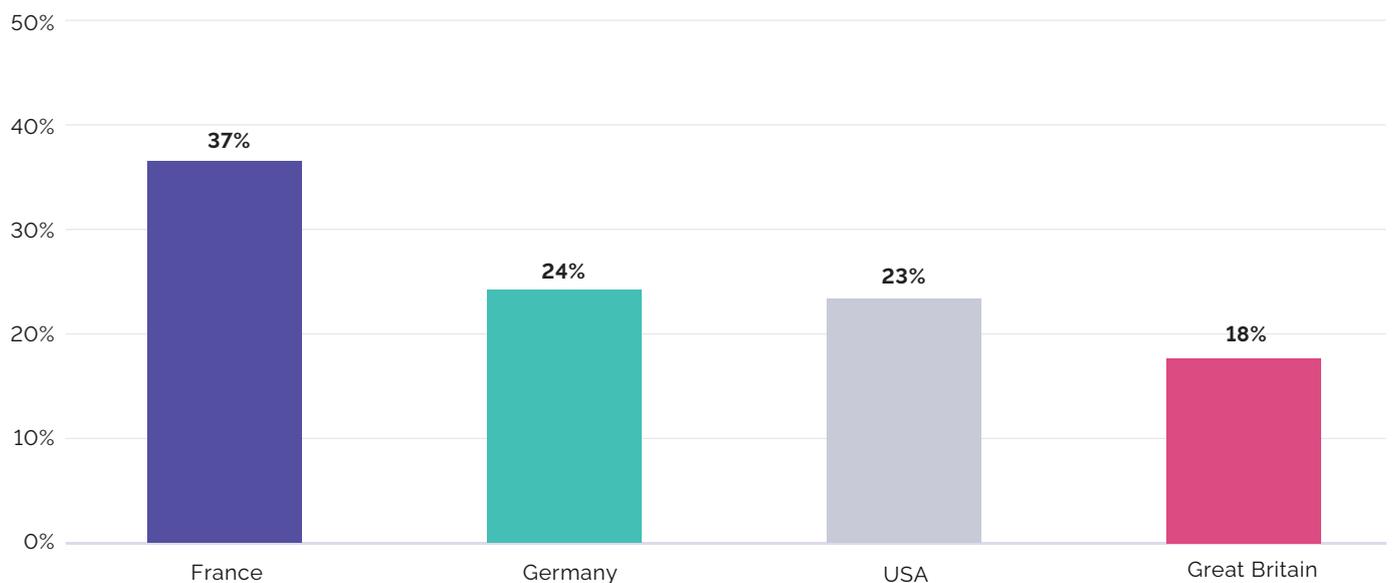


Figure 35

To what extent do you agree or disagree with the following statement:



5G IN CHINA

China has so far driven the world's adoption of 5G. At the end of 2020, 170 million of 260 million smartphones connected to 5G networks worldwide were in China, where half of new smartphones sold now feature 5G support. In China, telcos are expected to build over one million new 5G base stations in 2021, as the cost of doing so shrinks.

When the country's government announced its 14th five-year plan in April, Xi Jinping found it impossible to pass up the chance to make it about 5G. With 341 5G connected cities, compared to 279 in the US, 5G represents an undoubted success story for Beijing. This is helpful news as China confronts a looming economic cold war with Washington. China has seen its access to state-of-the-art semiconductor chips cut off, and Shenzhen-based technology giant Huawei has been effectively ejected from the global smartphone market.

Nonetheless, with plentiful cheap-and-cheerful 5G devices, the percentage of China's population carrying them leads other countries by a significant margin. Operators are led by China Mobile, already the world's largest operator in terms of subscribers, who have added 189 million 5G subscribers as of March, up from 32 million a year before. China Telecom trails it with 103 million

5G subscribers, followed by China Unicom with 92 million.

Not surprisingly, China is far ahead of other countries too in the likelihood of respondents to have a 5G enabled handset: with 55%, it is the only country in our sample where a majority already have a 5G device. Only the UAE, with 48%, comes near.

Currently 13% of Chinese respondents have 5G tariffs for their main mobile handset, also the highest of any country in our sample. (Again, it's only the UAE at 12% which is close to this among the countries in this study.)

One characteristic of the Chinese market revealed in our data is that Chinese respondents are much more likely than counterparts elsewhere to use mobile wireless hotspots, or MiFi (56%, compared to a global average of 24%).

Backing up China's strong early-adoption behaviors is the belief 5G will change how people connect to the internet (80%, tied with India and second only to Indonesia with 83%). Finally, 57% of Chinese respondents are willing to pay more for 5G, placing it in the top three in our study (behind only Indonesia with 60% and India with 59%).



5G IN INDIA AND INDONESIA

In these two other Asian countries, even though there has not yet been widespread 5G rollout, our data suggests particularly great awareness of 5G and willingness to pay for it when it arrives.

India

5G in India isn't likely to fully launch until late 2022. Exclusion of Huawei and ZTE from these trials suggests Delhi may side with Washington in shunning Chinese involvement in their 5G infrastructure, following India's border clashes with China in the summer of 2020. India is poised to delay 5G spectrum auctioning into the first quarter of 2022. As a result, Indian mobile operators like Jio, with aspirations to move into other markets, are held back until they can launch in their home market.

India is an extremely enthusiastic market about 5G. About three in five (59%) consumers in India are willing to pay more to access 5G, more than in any country apart from Indonesia (60%). Four out

of five (80%) Indians believe 5G will change how people connect to the internet (tied with China, and second to Indonesia with 83%).

Indian respondents also appear enthusiastic about new and emerging technologies, and are more likely than the global average to have smartwatches (24%, versus 20%), and virtual reality headsets (10%, against 7%).

Indians are more likely than respondents from any other country to be worried about the effects of 5G. About half (53%) of people in India agree with the statement "I am worried about 5G networks", more than in UAE (48%) and China (41%).

Indonesia

Another country where 5G's arrival is delayed but where our data reveals great anticipation is Indonesia. It has 345 million mobile subscriptions for 273 million people, and its telecoms and digital services industry is worth \$27 billion.

A lack of spectrum has postponed a widespread 5G rollout, but if Indonesia can start service by 2022, it could have 100 million 5G subscribers by 2025, estimates Hari Venkatarmani from consultancy firm AT Kearney.

A first commercial rollout occurred in May when the state-owned operator Telkomsel launched a 5G service in several high-end residential areas around Jakarta and nearby South Tangerang. Indonesia's president Joko Widodo has declined to shun Huawei, and has earned a reputation for navigating the US-China rivalry without taking sides.

Indonesia stands out in several respects in future intentions. Our research shows Indonesians are more likely than consumers in any other country in our study to be willing to pay more to access 5G (60%). Indonesians are also more likely than any other country to say they are likely to get a 5G tariff (86%, ahead of China with 81% and India with 76%).

Alongside these pioneering attitudes and behaviors is strong agreement that 5G will change how people connect to the internet; 83% agree with the sentiment, the highest of any country in our study.

Indonesians are also more likely than any other country to say they are likely to get a 5G tariff



CONCLUSION

The research in this whitepaper shows — particularly for consumers in the US and European markets — telcos need to do a much better job making the case for 5G and its benefits.

Only in China does most of the population currently possess a 5G device (with the UAE close behind). In wealthy and developed countries like the US, Britain and France, respondents remain less convinced 5G will change how people connect to the internet, and less likely to pay more for 5G connections. Still, they could very well be convinced otherwise: US respondents see network providers' advertisements, and Great Britain consumers pay attention to news coverage about 5G.

At the same time, network providers can take comfort in the fact that roughly three in five consumers worldwide 55 and younger consider themselves likely to pay 5G tariffs in the future. From that vantage, broader 5G adoption appears simply a matter of time.

What does the near future hold for 5G worldwide?

Altogether (and now including the older respondents), half of those surveyed believe they will pay for a 5G tariff in the future. The remaining half are evenly split between those who say they won't pay, and those who say they aren't sure. It is likely that this number will easily surpass 52% as those in the other two groups become convinced of the benefits of 5G.

Similar to what we have seen earlier, purchase intent around 5G is far greater in emerging markets. Over three out of four respondents (76%) in emerging markets say they will pay a 5G tariff, compared to only four out of ten (41%) in developed nations.

At a national level, in intent to pay for a 5G tariff in the future, we see Asian nations and the UAE clearly leading the way, with Indonesia holding down the high end with 86% of its population planning to pay for 5G plans in the future. On the other extreme only 2 in 10 (22%) US respondents say they are likely to pay for 5G in the future, putting the US squarely at the bottom of nations surveyed.

We have now ventured far enough into the 5G age that it has been possible, in our global survey, to discern some interesting patterns:

- **China is ahead of the curve.** More than half (55%) of Chinese respondents already possess a 5G handset, the only country where a majority do so. The UAE is a strong second, at 48%. Otherwise, Asian countries like Indonesia (33%) and India (32%) make for a telling contrast with the US (26%), Germany (17%), Great Britain (16%) and France (16%).
- **Asian respondents are much more likely to be willing to pay more for a 5G subscription** compared with those in Western Europe and the US. While 60% of Indonesians, 59% of Indians, and 57% of Chinese respondents agreed with the statement "I am willing to pay more to access 5G", only 19% of Germans, 18% of Americans, 14% of Brits, and 9% of French respondents were.
- **Similarly, Asian respondents are also much more likely to think 5G will change how people connect to the internet.** More than four out of five (83%) Indonesians and roughly the same proportion (80%) of Indians and Chinese respondents agreed with this sentiment, while only 46% of Germans, 44% of Americans, 40% of French respondents, and 39% of Americans did.

- **But Asian countries also were more likely to have concerns about 5G's effects.** About half (53%) of Indians, 41% of Chinese respondents, and 39% of Indonesians said they were worried about 5G networks. Concern in France (37%) is very high in this regard for Europe and North America, with 24% of Germans, 23% of Americans, and 18% of Brits expressing worries.

For the moment, the day in 5G belongs to Asia. This highlights the opportunity and task ahead for telcos to gain ground in the West.

Providers clearly need to improve their communications in educating consumers on the benefits of 5G. When two in five Americans do not know if 5G will change how they connect to the internet, and only 12% of Great Britain respondents cite mobile network advertisements as a source of information about 5G, it is clear telcos need to improve their marketing efforts. This is an area where YouGov's data coverage and expertise make it an important resource for companies in better targeting consumers who today are uninformed, skeptical, and unenthusiastic.

METHODOLOGY

This report was produced from a recent global custom survey among YouGov's industry-recognized panel, on the topic of 5G technology, covering 17 markets and 18,803 respondents globally. Our insights were further bolstered by connecting our custom survey results at the respondent level to the YouGov Cube, our proprietary connected data set encompassing over one million data points, collected over the course of a decade from our panel members worldwide. It is this combination of panel size and quality, breadth of variables, longitudinal history, and global coverage that allows us to provide a comprehensive view of consumer behaviors and attitudes globally.

For this report, our study results were connected at the respondent level to YouGov's proprietary data solutions, YouGov BrandIndex and YouGov Profiles, allowing us to merge our respondents and their answers to the 100,000s of consumer attributes that we collect on an ongoing basis for audience segmentation and profiling. Our survey was fielded throughout the month of April 2021.

The YouGov panel provides a naturally accurate and representative view of the population. Data is adjusted through a mild weighting team using interlocking demographic characteristics, a methodology considered advanced in the market research space. For this paper, the following population representation was used:

Region	Market	Population Sampled Representation	Target sample size
APAC	Australia	National representative - 16+	1,028
	China	National Online - 16+	1,022
	Hong Kong	National Online - 18+	508
	Indonesia	National Online - 18+	1,033
	India	National Online (Urban only) - 18+	996
	Singapore	National representative - 18+	1,030
MEA	United Arab Emirates (UAE)	National Online (Urban focus) - 18+	1,042
North America	Mexico	National representative - 18+	1,037
	United States	National representative - 18+	2,019
Europe	Denmark	National Online (Urban focus) - 18+	1,007
	France	National representative - 18+	1,000
	Germany	National representative - 18+	1,052
	Great Britain	National representative - 18+	2,002
	Italy	National representative - 18+	1,006
	Poland	National representative - 18+	1,005
	Spain	National representative - 18+	1,004
	Sweden	National representative - 18+	1,012

DEFINITIONS AND DATA AGGREGATIONS

Several data points and charts have aggregated information grouped as "Mature" and "Emerging" markets. Country groupings used in the paper are found in the table below.

Market types (based on [Morgan Stanley Capital Index \(MSCI\) Market Classification](#))

Mature	Emerging
Australia	China
Denmark	India
France	Indonesia
Great Britain	Mexico
Germany	Poland
Hong Kong	United Arab Emirates (UAE)
Italy	
Singapore	
Spain	
Sweden	
United States	



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